

SECURITIES AND EXCHANGE COMMISSION

FORM 10-K

Annual report pursuant to section 13 and 15(d)

Filing Date: **1999-03-26** | Period of Report: **1998-12-31**  
SEC Accession No. **0000927016-99-001146**

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FILER

**TRANSWITCH CORP /DE**

CIK: **944739** | IRS No.: **061236189** | State of Incorpor.: **DE** | Fiscal Year End: **1231**  
Type: **10-K** | Act: **34** | File No.: **000-25996** | Film No.: **99574403**  
SIC: **3674** Semiconductors & related devices

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SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

Form 10-K

Annual Report Pursuant to Section 13 or 15(d) of the Securities  
Exchange Act of 1934 for the Fiscal Year Ended December 31, 1998

or

Transition Report Pursuant to Section 13 or 15(d) of the Securities  
Exchange Act of 1934

for the transition period from to

Commission File Number 0-25996

TRANSWITCH CORPORATION  
(Exact name of Registrant as Specified in its Charter)

Delaware 06-1236189  
(State of Incorporation) (I.R.S. Employer Identification Number)

Three Enterprise Drive  
Shelton, Connecticut 06484  
(Address of Principal Executive Offices)

Telephone (203) 929-8810

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes X No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

The aggregate market value of the voting stock held by non-affiliates of the Registrant, based upon the closing sale price of Common Stock on February 26, 1999, as reported on the Nasdaq National Market, was approximately \$480,786,370. Shares of Common Stock held by each executive officer and director and by each person who to the Company's knowledge owns 5% or more of the outstanding voting stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

Common Stock, par value \$.001 per share, outstanding at February 28, 1999:

## DOCUMENTS INCORPORATED BY REFERENCE

Parts of the following document are incorporated by reference in Part III of this Form 10-K Report:

(1) Proxy Statement for Registrant's 1999 Annual Meeting of Shareholders-- Items 10, 11, 12 and 13.

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## PART I

## ITEM 1. BUSINESS

The following description of the Company's business should be read in conjunction with the information included elsewhere in this document. The description contains certain forward-looking statements that involve risks and uncertainties. When used in this document, the words "intend," "believe," "estimate," "plan," "expect" and similar expressions as they relate to the Company are included to identify forward-looking statements. TranSwitch Corporation's actual results could differ materially from the results discussed in the forward-looking statements as a result of certain of the risk factors set forth elsewhere in this document. See also "Item 7. Managements Discussion and Analysis of Financial Condition and Results of Operations-- Certain Factors That May Affect Future Results."

## General

TranSwitch Corporation, a Delaware corporation established in April 1988 ("TranSwitch" or the "Company"), designs, develops, markets and supports highly integrated digital and mixed-signal (analog and digital) semiconductor solutions for the telecommunications and data communications markets. The Company's customers are original equipment manufacturers (OEMs) who serve three communications market segments: worldwide public network infrastructure that supports voice and data communications, Internet infrastructure and corporate wide area networks (WANs).

The Company's products are Very Large Scale Integrated (VLSI) semiconductor devices that provide core functionality for communications network equipment. The Company's VLSI solutions are programmable to provide high levels of functionality for high-speed broadband communication networks. These products are incorporated into an OEM's networking equipment. TranSwitch's VLSI devices are compliant with SONET/SDH (Synchronous Optical Network/Synchronous Digital Hierarchy), asynchronous and ATM (Asynchronous Transfer Mode) standards. The Company's mixed-signal and digital design capability, together with its telecommunications systems expertise, enables it to determine and implement optimal combinations of design elements for enhanced functionality. The Company believes that this approach allows its customers to achieve faster time to market and to introduce systems that offer greater functionality, improved performance, lower power dissipation, reduced system size and cost and greater reliability relative to discreet solutions.

## Products and Applications

TranSwitch supplies high-speed, broadband VLSI semiconductor devices to systems vendors who serve three fast-growing market segments: the worldwide

public network infrastructure that supports both voice and data communications, the Internet infrastructure that supports the World Wide Web and other data services and corporate WANs. The Company's core competencies as a systems-on-chip innovation leader include:

- . an in-depth understanding of SONET/SDH, asynchronous and ATM standards;
- . the ability to design complex mixed-signal high-speed VLSI devices; and
- . the capability to verify the design against customers' requirements and industry standards through analysis, simulation and certification.

The Company's three product lines consist of SONET/SDH, asynchronous and ATM products. The Company believes that its chip-set approach and broad product coverage in all three product lines position it as a "one stop source" for broadband communications VLSI products. Network equipment vendors can mix and match TranSwitch's VLSI devices to optimally configure a specific system. The Company's product lines can be combined to provide a cost-effective solution with increased functional integration and features, while providing seamless integration of SONET/SDH, asynchronous and ATM/Internet protocol applications.

The prices for the Company's products typically range from approximately \$20 to \$300, depending on volume, complexity and functionality.

1

#### SONET/SDH Products

In the SONET/SDH area, the Company offers devices that provide a direct interface for fiber optic transmission in North America, Europe and the Far East. The Company's mappers, which bridge the interconnection between SONET/SDH equipment and asynchronous equipment, allow DS-series and E-series transmission lines to be connected with SONET/SDH lines. In this way, these mappers transparently transport asynchronous signals across the SONET/SDH network.

TranSwitch's current SONET/SDH products are used to build add/drop multiplexers, digital cross connects and other telecommunications and data communications equipment. This equipment is configured for use in both domestic and international fiber-based public networks. The Company's SONET/SDH products also have applications in customer premise equipment products such as routers and hubs in central offices, adding integrated fiber optic transmission capability to telephone switches.

#### Asynchronous Products

TranSwitch's asynchronous products provide high bandwidth connections and can be used to configure transmission products for use in the public network. This equipment is used to increase the capacity of the copper-based public network. TranSwitch's asynchronous VLSI solutions also include customer premises equipment products such as hubs and routers used in WANs and LANs to access the public network for voice and data communication with similar products in other locations.

TranSwitch's asynchronous products provide high levels of integration, as well as cost, power and performance advantages relative to discrete and competing integrated circuit solutions. The Company's asynchronous VLSI products include devices that provide solutions DS-1 through DS-3 and E-1

through E-3 transmission lines. This product line also includes multiplexers, which are devices that combine multiple low-speed lines to form a higher speed line, and demultiplexers, which perform the reverse function. In addition, the Company offers framers, devices that identify the starting point of defined bit streams and enable systems to recognize the remaining bits.

#### ATM Products

TranSwitch's ATM family of products targets the core elements of ATM-based multi-service access multiplexer systems. The Company's ATM products also include VLSI semiconductor devices for line interfacing and service adapter functions. TranSwitch's CellBus is a system architecture for implementing ATM access multiplexers and ATM switching systems.

#### Technology

The Company believes that one of its core competencies is the telecommunications and data communications knowledge and expertise of its key executives and its systems engineering organization. The systems engineering group possesses substantial telecommunications and data communications design experience, as well as extensive knowledge of relevant standards. This includes not only a thorough understanding of the actual written standards, but also an awareness of and appreciation for the nuances associated with these standards necessary for assuring that device designs are fully compliant. The Company's telecommunications and data communications experience and its participation in the standards development process provide it with significant advantages in designing semiconductor devices meeting the evolving needs of its customers.

Complementing the Company's accumulated communications industry expertise is its VLSI design competence. The Company's VLSI design staff has extensive experience in designing analog and mixed-signal devices, which require a sophisticated understanding of complex technology, as well as the specifics of manufacturing processes and their resulting impact on device performance. TranSwitch has also developed a large number of VLSI blocks that operate under the demanding requirements of the telecommunications and data

2

communications industry. These blocks have been designed using standard VLSI-oriented programming languages such as VHDL and M (a C-like language) to create new devices that meet expanding customer requirements. Availability of these blocks and ability to access higher density manufacturing processes allow the Company to develop a device to execute multiple functions that were previously available only from a combination of discrete devices.

TranSwitch has also developed a proprietary toolset called "Test Benches," which facilitate on-time development of products and help assure that products meet customer and standards requirements. These Test Benches consist of behavior models of all applicable functions in a high level design environment. These Test Benches also include test signal generators and analyzers such as models of SONET/SDH signals. Systems engineers use Test Benches to test new architectural concepts, while VLSI designers use Test Benches to ensure that the device conforms to product specifications. The Company believes that the availability of Test Benches provides it with a competitive advantage.

The Company has invested significant resources in developing an architecture

that allows increased programmability. Programmability provides accelerated time-to-market by decoupling hardware and software verification. In addition, programmability permits standards upgrades and fixes to be effected more easily. Further, customers can have the flexibility to tailor their products to their specific requirements.

The Company has also developed expertise and hardware/software tools to certify products against customer and standards requirements. While the Test Bench is used to test the software model of the VLSI device, these certification tools are used to verify operation of actual device prototypes. The Company shares its certification board, the platform used to certify a particular device, with sponsoring customers, thereby accelerating their time to market. The Company's certification approach and tools have been recognized by customers as a key benefit.

## Sales and Marketing

TranSwitch's marketing strategy focuses on key customer sponsorships to promote early adoption of the Company's VLSI devices in the products of system vendors who are market leaders. Through the Company's customer sponsorship program, customers provide direct feedback on product specifications and applications while participating in product testing in parallel with the Company's certification process. This approach accelerates customers' time to market while enabling the Company to achieve early design wins for its products and derive non-recurring engineering expense support and volume commitments for specific products from these sponsors.

TranSwitch's sales strategy is to focus on worldwide suppliers of high-speed communications and communications-oriented equipment. These customers are easily identifiable and include telecommunications, data communications, Internet, customer premises equipment, computing, process control and defense equipment vendors. The Company has established a direct sales force and a worldwide network of independent distributors and sales representatives for marketing its products.

TranSwitch's direct sales force, technical support personnel and key engineers work together in teams to support key customers. TranSwitch has located technical support capabilities in key geographical locations, including Europe and the Far East. These field sales engineers and independent distributors and sales representatives support the Company's customers. TranSwitch maintains a technical support team at the Company's headquarters as a backup to the field sales engineers.

TranSwitch has established foreign distributors and sales representative relationships in Australia, Benelux, Canada, China, France, Germany, Great Britain, Israel, Italy, Japan, Korea, Spain, Sweden, Switzerland and Taiwan. The Company also sells its products through domestic distributors and a network of domestic sales representatives. The Company has regional sales and technical support capabilities in Boston, Ma., Chicago, Ill., San Jose, Ca., Morristown, N.J., Atlanta Ga., Ottawa, Ontario, Canada, Brussels, Belgium, and Taipei, Taiwan, as well as in its headquarters facility in Shelton, Connecticut.

## Customers

Since shipping its first product in 1990, the Company has sold its products

and services to over 400 customers. The Company's customers include: public network systems suppliers that incorporate the Company's products into telecommunications systems, WAN and LAN equipment suppliers, Internet oriented OEMs, communications test and performance measurement equipment suppliers, and government, university and private laboratories that use the Company's products in advanced public network and WAN/LAN development projects.

Foreign sales represented 46%, 33% and 46% of total revenues during 1998, 1997 and 1996, respectively.

The following revenues from external customers is based on the geographic location of the Company's customers. All sales are exported from the United States and are denominated in U.S. dollars.

<TABLE>  
<CAPTION>

Region	Year ended December 31,		
	1998	1997	1996
	(in millions)		
	<C>	<C>	<C>
United States.....	\$ 23.7	\$ 18.1	\$ 10.8
Israel.....	5.8	0.5	4.2
China.....	7.2	1.8	0.4
Other regions.....	7.5	6.7	4.3
	-----	-----	-----
Total revenues.....	\$ 44.2	\$ 27.1	\$ 19.7

The following table sets forth for the periods indicated, the percentage of the Company's total revenues derived from its significant customers listed below:

<CAPTION>

Customer	Year ended December 31,		
	1998	1997	1996
	<C>	<C>	<C>
Columbia Technologies (1).....	15%	*	*
Insight Electronics, Inc. (1).....	20%	41%	16%
Tellabs Operations, Inc. (2).....	21%	16%	14%
ECI Telecom, Ltd.....	*	*	22%

</TABLE>  
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\* Below 10% of the Company's total revenues.

- (1) Columbia Technologies and Insight Electronics are distributors of our products to various end-users, none of which comprised more than 10% of the Company's total revenues during the periods mentioned.
- (2) The Company's sales to Tellabs during 1996 and 1997 were made through Reptron Electronics, Inc., Tellabs' designated distributor. During 1998, sales to Tellabs were made through Reptron and Arrow Electronics Inc., also Tellabs' designated distributor. Sales to Tellabs through Arrow during 1998 represented 17% of the Company's total revenues.

#### Research and Development

The Company believes that the continued introduction of new products in its target markets is essential to its growth. As of December 31, 1998, the

Company had 72 full-time employees engaged in research and development efforts. The Company believes that its research and development staffing will only moderately increase in 1999. Expenditures for research and development in 1998, 1997 and 1996 were approximately \$11.1 million, \$9.2 million and \$8.9 million, respectively.

All developments are carried out using ISO 9001 certified design processes and the design tools/environment are continuously enhanced for improvement in design, fabrication and verification of its products. The Company invests in establishing and enhancing its design process, tools, methodology and proprietary Tests Benches. From time to time, the Company acquires products from third parties to enhance its product lines. The Company's internal research and development organization thoroughly reviews the external development processes and the design of these products as part of its quality assurance process.

4

#### Patents and Licenses

The Company has 24 patents issued and 10 patent applications pending in the U.S. Of the 24 issued patents, one is co-owned by ECI Telecom Ltd. and one is co-owned by Siemens Telecommunications Systems Ltd. The Company has five patents issued and 15 patent applications pending in Canada. The Company has six patents issued in Taiwan, with one patent being co-owned by Siemens Telecommunications Systems Ltd. The Company has three patents issued and four patents pending in the People's Republic of China. The Company has 16 patent applications pending in selected countries in the European Patent Office (EPO) and one patent issued in France, Germany and the U.K. In addition, the Company has seven patent applications pending in Japan and four patents issued and four patents pending in Israel. Further, the Company has one patent application pending under the Patent Cooperation Treaty (PCT) with the possibility of filing in the EPO, Canada, China, Mexico, Norway, Japan and Israel. None of the Company's domestic and foreign patents that have issued will expire in the near future unless the Company chooses not to pay renewal fees. The Company's oldest patent is not scheduled to expire for more than ten years.

The Company cannot guarantee that its patents will not be challenged or circumvented by its competitors, nor can the Company be sure that pending patent applications will ultimately be issued as patents. Under current law, patent applications in the United States are maintained in secrecy until patents are issued, and the right to a patent in the United States is attributable to the first to invent, not the first to file a patent application. In the process of obtaining foreign patents, patent applications are published approximately 18 months after their priority (U.S.) filing date, and the right to a patent is determined by the first to file an application. The Company cannot be sure that its products or technologies do not infringe patents that may be granted in the future pursuant to pending patent applications or that its products do not infringe any patents or proprietary rights of third parties. From time to time, the Company receives communications from third parties alleging patent infringement. In the event that any relevant claims of third-party patents are upheld as valid and enforceable, the Company could be prevented from selling its products or could be required to obtain licenses from the owners of such patents or be required to redesign its products to avoid infringement. The Company cannot assure that such licenses would be available or, if available, would be on terms acceptable to the Company or that the Company would be successful in any



attempts to redesign its products or processes to avoid infringement. The Company's failure to obtain these licenses or to redesign its products would have a material adverse effect on the Company's business, financial condition and results of operations.

The Company also has been granted registration of 10 trade or service marks in the U.S., and it has seven more U.S. applications for trademarks awaiting approval. The Company has also filed three trademark applications under the European Trademark (ECT) procedure.

The Company's ability to compete depends upon its ability to protect its proprietary information through various means, including ownership of patents, copyrights, mask work registrations and trademarks. While no intellectual property right of the Company has been invalidated or declared unenforceable, there can be no assurance that such rights will be upheld in the future. The Company believes that, in view of the rapid pace of technological change in the semiconductor industry, the technical experience and creative skills of its engineers and other personnel are the most important factors in determining the Company's future technological success.

TranSwitch has entered into various license agreements for product or technology exchange. The purpose of these licenses has, in general, been to obtain second sources for standard products or to convey or receive rights to certain proprietary or patented cores, cells or other technology. In March 1995, the Company entered into an agreement with StrataCom, Inc., whereby the Company obtained the right to use intellectual property covered by two StrataCom patents.

The Company sells its products into the telecommunications industry, an industry whose products are subject to various standards that are agreed upon by recognized industry standards committees. Where applicable, the Company designs its product to be in conformity with these standards. The Company has received and expects to continue to receive, in the normal course of business, communications from third parties stating

5

that if certain of TranSwitch's products meet a particular standard, these products may infringe one or more patents of that third party. After a review of the circumstances of each communication, the Company in its discretion and upon the advice of counsel has taken or may take in the future one of the following courses of action: the Company may negotiate payment for a license under the patent or patents that may be infringed, the Company may use its technology and/or patents to negotiate a cross-license with the third party or the Company may decline to obtain a license on the basis that it does not infringe the claimant's patent or patents, that such patents are not valid or on other basis. The Company cannot assure that licenses for any of these patents will be available to the Company on reasonable terms or that the Company would prevail in any litigation seeking damages or expenses from the Company or to enjoin the Company from selling its products on the basis of any of the alleged infringements.

#### Manufacturing and Quality

TranSwitch's manufacturing objective is to produce reliable, high quality devices cost-competitively. To this end, the Company seeks to differentiate itself by:

- . maximizing the reliability and quality of its products;
- . achieving on-time delivery of its products to its customers;
- . minimizing capital and other resource requirements by subcontracting capital-intensive manufacturing; and
- . achieving a gross margin commensurate with the value of its products.

Effective June 25, 1997, the Company was registered by TUV Rheinland of North America, Inc. as complying with the requirements of ISO-9001.

All of the Company's VLSI devices are manufactured by established independent foundries. This approach permits the Company to focus on its design strengths, minimize fixed costs and capital expenditures and access diverse manufacturing technologies. Currently, the Company utilizes four foundries, three of which are located in the U.S. and the fourth in Taiwan, to process its wafers: Texas Instruments Incorporated (TI), Symbios Logic Inc. and LSI Logic Corporation in the U.S. and Taiwan Semiconductor Manufacturing Company Limited (TSMC) in Taiwan. Foundries are required to have qualified and reliable processes. The selection of a foundry for a specific device is based on availability of the required process technology and the foundry's capability to support the particular set of tools used by TranSwitch for that device.

Currently, TI manufactures all of the Company's BiCMOS devices. The Company entered into a foundry agreement with TI in December 1995, pursuant to which the Company received access to TI's process technology through 2000. The Company also has an agreement with TSMC that guarantees the Company a minimum capacity level through 1999, and in return the Company has agreed to purchase unutilized commitment below an agreed minimum level. See also Note (11) of "Notes to Consolidated Financial Statements."

There are certain significant risks associated with the Company's reliance on outside foundries, including:

- . the lack of assured wafer supply and control over delivery schedules;
- . the unavailability of or delays in obtaining access to key process technologies; and
- . limited control over quality assurance, manufacturing yields and production costs.

In addition, the manufacturing of integrated circuits is a highly complex and technologically demanding process. Although the Company has undertaken to diversify its sources of semiconductor device supply and works closely with all its foundries to minimize the likelihood of reduced manufacturing yields, the Company's foundries have from time to time experienced lower than anticipated manufacturing yields, particularly in

6

connection with the introduction of new products and the installation and start up of new process technologies. Reduced yields have at times adversely affected the Company's operating results.

Competition

The semiconductor industry is intensely competitive and is characterized by the following:

- . price erosion;
- . rapid technological change;
- . shortage in fabrication capacity;
- . heightened international competition in many markets; and
- . unforeseen manufacturing yield problems.

The communications and data communications industries, which are the primary target markets for TranSwitch, are also becoming intensely competitive because of deregulation and heightened international competition.

The Company's competition consists of suppliers of similar products from the United States as well as other countries, including internal competition from semiconductor divisions of vertically integrated companies such as IBM Corporation, Lucent Technologies Inc., NEC Corporation and Siemens AG. New entrants are also likely to attempt to obtain a share of the market for the Company's current and future products.

The Company's principal competitors in the asynchronous and SONET/SDH areas are Applied Micro Circuits Corporation, Crystal Semiconductor Corporation, Dallas Semiconductor Corporation, EXAR Corporation, Lucent Technologies Inc., National Semiconductor Corporation, PMC-Sierra Inc., Texas Instruments Incorporated, TriQuint Semiconductor Corporation, Vitesse Semiconductor Corporation and VLSI Technology, Inc. In addition, there are a number of ASIC vendors, including AMI Industries, Inc., LSI Logic Corp. and STM Microelectronics Group, who compete with the Company by supplying customer-specific products to OEMs. In the ATM area, the Company's principal competitors include all the vendors mentioned above and, in addition, Advanced Micro Devices, Inc., Integrated Device Technology, Inc. and MMC Networks, Inc. Numerous other domestic and international vendors have announced plans for entering this market.

TranSwitch believes that the principal bases of competition in the semiconductor industry include:

- . product definition;
- . product design;
- . test capabilities;
- . reliability;
- . price;
- . functionality;
- . time-to-market; and
- . reputation.

The Company believes that it competes favorably with respect to these

factors. TranSwitch also believes that its competitive strengths include the distribution channels it has established, the Company's workforce of highly experienced digital and mixed-signal circuit designers with strong systems architecture skills and its proprietary design and development tools, including its proprietary simulations and testing software and its library of analog and digital blocks and cells.

7

The ability of the Company to compete successfully in the rapidly evolving area of high performance integrated circuit technology depends on factors both within and outside its control, including:

- . success in designing and subcontracting the manufacture of new products that implement new technologies;
- . protection of Company products by effective utilization of intellectual property laws;
- . product quality;
- . reliability;
- . price;
- . efficiency of production;
- . the pace at which customers incorporate the Company's integrated circuits into their products;
- . success of competitors' products; and
- . general economic conditions.

#### Backlog

As of December 31, 1998, the Company's backlog was \$14.0 million, as compared to \$9.4 million as of December 31, 1997. Backlog represents firm orders anticipated to be shipped within the next 12 months. The Company's business and, to a large extent, that of the entire semiconductor industry is characterized by short-term order and shipment schedules. Since orders constituting the Company's current backlog are subject to changes in delivery schedules or to cancellation at the option of the purchaser without significant penalty, backlog is not necessarily an indication of future revenue.

#### Employees

As of December 31, 1998, the Company had 140 full time employees. The Company's employees are not represented by any collective bargaining agreement, and the Company has never experienced a work stoppage. The Company believes that its employee relationships are good.

#### ITEM 2. PROPERTIES

##### Facilities

The Company's headquarters are located in a suburban office park in Shelton, Connecticut where it leases approximately 40,000 square feet in a four story office building. Product development and all final inspection and shipping, marketing and administration activities are located at this facility. Approximately 90% of the existing space is fully utilized, and the Company expects to lease additional space in 1999. The lease is due to expire in November 2007. The Company also leases approximately 1,200 square feet in Research Triangle Park, North Carolina where additional product development efforts take place. In September 1997, the Company leased approximately 3,200 square feet in Stoneham, Massachusetts for product development and sales support. The Company leases a 1,400 square foot sales and support facility in San Jose, California. The Company also maintains a small sales office in Brussels, Belgium. In January 1997, the Company opened a new leased facility of 2,000 square feet in Taipei, Taiwan for product development and sales support, and in May 1998, the Company opened a 2,500 square-foot facility in New Delhi, India for product development.

ITEM 3. LEGAL PROCEEDINGS

None.

ITEM 4. SUBMISSION OF MATTERS TO A VOTE OF SECURITY-HOLDERS

No matters were submitted to a vote of security holders during the three months ended December 31, 1998.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY AND RELATED STOCKHOLDER MATTERS

The Company's Common Stock has been quoted on the Nasdaq National Market tier of The Nasdaq Stock Market under the symbol "TXCC" since its initial public offering on June 14, 1995. The following table sets forth, for the periods indicated, the range of quarterly high and low bid information for the Company's Common Stock as reported on the Nasdaq National Market:

<TABLE>

<CAPTION>

	High Bid	Low Bid
	-----	-----
	<C>	<C>
<S>		
1997		
First Quarter.....	\$ 7.38	\$ 4.63
Second Quarter.....	9.75	4.00
Third Quarter.....	12.13	8.13
Fourth Quarter.....	14.13	6.75
1998		
First Quarter.....	\$12.38	\$ 7.50
Second Quarter.....	15.13	10.75
Third Quarter.....	19.88	12.75
Fourth Quarter.....	44.88	10.88

</TABLE>

As of February 28, 1999, there were approximately 186 holders of record of the Company's Common Stock.

The Company has never paid cash dividends on its Common Stock. The Company currently intends to retain earnings, if any, for use in its business and does not anticipate paying any cash dividend in the foreseeable future. In addition, the Company's line of credit loan agreement prohibits the payment of cash dividends without prior bank approval. Any future declaration and payment of dividends will be subject to the discretion of the Company's Board of Directors, will be subject to applicable law and will depend upon the Company's results of operations, earnings, financial condition, contractual limitations, cash requirements, future prospects and other factors deemed relevant by the Company's Board of Directors.

ITEM 6. SELECTED FINANCIAL DATA

The following table includes selected consolidated financial data for each of the five years ended December 31, 1998, which are derived from and more fully described in the consolidated financial statements and notes included in this report at Item 14.

Amounts presented in thousands, except per share data

<TABLE>

<CAPTION>

	Years Ended December 31,				
	1998	1997	1996	1995	1994
<S>	<C>	<C>	<C>	<C>	<C>
Consolidated Statement of Operations Data:					
Total revenues.....	\$44,169	\$27,084	\$19,650	\$17,466	\$12,101
Gross profit.....	27,524	15,830	5,844	10,071	6,185
Net income (loss).....	6,003	( 1,873)	(10,077)	(1,773)	(3,937)
Diluted earnings (loss) per share (1).....	\$ .40	\$ ( .15)	\$ (.86)	\$ (.18)	\$ (.48)
Shares used in calculation of diluted earnings (loss) per share.....					
	14,883	12,152	11,751	10,062	8,178

<TABLE>

<CAPTION>

	December 31,				
	1998	1997	1996	1995	1994
<S>	<C>	<C>	<C>	<C>	<C>
Consolidated Balance Sheet Data:					
Cash, cash equivalents and short term investments(2).....	\$27,196	\$21,618	\$12,688	\$17,250	\$ 3,352
Working capital.....	33,758	25,648	14,650	21,811	3,656
Total assets.....	47,809	36,589	23,311	32,670	8,969
Note payable to bank.....	--	--	--	--	1,191
Mandatorily redeemable convertible preferred stock.....	--	--	--	--	20,252
Stockholders' equity (deficit).....	\$40,354	\$30,161	\$17,299	\$26,706	\$(15,324)

</TABLE>

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- (1) Gives effect to the mandatory conversion of all then outstanding Preferred Stock into 7,009,742 shares of Common Stock on completion of the Company's initial public offering in June 1995. 1994 per share amount is based on pro-forma weighted average shares outstanding for 1994.
  - (2) Subsequent to the end of the fiscal year 1998, the Company completed a follow on public offering of 1,955,000 shares and raised, in the aggregate, \$68.4 million on February 12, 1999 and March 16, 1999, net of underwriters' commissions.

## ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following Management's Discussion and Analysis of Financial Condition and Results of Operations contains forward-looking statements that involve risks and uncertainties. When used in this document, the words, "intend," "anticipate," "believe," "estimate," "plan," "expect" and similar expressions as they relate to the Company are included to identify forward-looking statements. The Company's actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including those set forth under "Certain Factors That May Affect Future Results." This discussion should be read in conjunction with the Consolidated Financial Statements and the notes thereto included in this report at Item 14.

### Overview

TranSwitch Corporation commenced its operations in April 1988. Since incorporation, TranSwitch has designed, sourced and marketed high-speed VLSI semiconductor devices for public and private network applications worldwide. TranSwitch shipped its first product in 1990 and has increased its volume of shipments over the last nine years. TranSwitch's product development efforts have been focused on devices that meet the needs of public and private network telecommunications and data communications equipment providers that serve the worldwide public network, Internet and corporate wide area network markets and are compliant with established standards in these markets, including SONET/SDH, asynchronous/PDH and ATM/IP.

The Company derives its revenues from product sales principally to domestic and international telecommunications and data communications equipment OEMs and to distributors. Revenues are recognized on product shipment. Agreements with certain distributors provide price protection and return and allowance rights. In certain cases, the Company works with network equipment OEMs during their system design phase with the goal of having TranSwitch's products designed into the OEMs' products. The Company's sales cycle often extends over more than one year because of the long lead times between the OEM's design and the start of volume shipments. The Company incurs product research and development expenses well before the generation of substantial revenues from product sales to OEMs. A significant portion of the Company's total revenues has been, and is anticipated to be, derived from foreign sales. All foreign sales are currently denominated in U.S. dollars. The Company's cost of revenues consists primarily of the purchase cost of finished VLSI devices produced by third party semiconductor manufacturers and amortization of product licenses. The Company intends to continue to outsource all of its VLSI device fabrication requirements.

Prior to the year ended December 31, 1998, TranSwitch had not been profitable, on a yearly basis, since its inception. As of December 31, 1998, the Company had an accumulated deficit of \$24.0 million. The Company's operating results are subject to quarterly and annual fluctuations as a result of several factors that could materially and adversely affect profitability. These factors include, among others:

- . the timing and cancellations of the Company's customers' orders;
- . market acceptance of products of both the Company and its customers;
- . the level of orders that are received and can be shipped in a quarter;
- . the timing and provision of price protection and returns from the Company's distributors;
- . availability and cost of semiconductor foundry capacity and materials;
- . fluctuations in manufacturing yields;
- . changes in product mix;
- . the Company's ability to introduce new products and technologies on a timely basis;
- . the introduction of products and technologies by the Company's competitors;
- . the timing of the Company's investments in research and development;

11

- . whether TranSwitch's customers purchase through a distributor or directly from the Company;
- . competitive pressures on selling prices; and
- . general economic conditions.

#### Results of Operations

##### Years Ended December 31, 1998, 1997 and 1996

Total Revenues. In 1998, the Company reported revenues of \$44.2 million, an increase of 63.1% over 1997. The increase was primarily driven by the strength in the Company's SONET/SDH product lines. In 1997, the Company reported revenues of \$27.1 million, an increase of 38.0% over 1996. The increase was primarily in product revenues as this was the Company's focus. The Company did not derive any revenue in 1998 or 1997 attributable to product license and royalty fees.

In 1998, Insight Electronics, Inc., Columbia Technologies (both distributors selling to various end users, none of which comprise more than 10% of the Company's total revenues) and Tellabs Operations, Inc. accounted for 20%, 15% and 21% of total revenues, respectively. In 1997, Insight Electronics, Inc. and Tellabs Operations, Inc. accounted for 41% and 16% of total revenues, respectively. In 1996, ECI Telecom, Ltd., Insight Electronics, Inc. and



Tellabs Operations, Inc. accounted for 22%, 16% and 14% of total revenues, respectively.

Foreign sales, consisting primarily of sales to customers in Europe, Israel and the Far East, constituted 46%, 33% and 46% of total revenues in 1998, 1997 and 1996, respectively.

Product revenues, net. In 1998, product revenues grew 64% to \$44.2 million from \$26.9 million in 1997. This growth was primarily driven by the strength of the Company's SONET/SDH product line. In 1997, product revenues grew 40.1% to \$26.9 million from \$19.2 million in 1996. This growth was driven by broad strength across all of the Company's product lines. In 1996, product revenues grew 16.8% to \$19.2 million from \$16.5 million in 1995. This growth was primarily driven by increased sales of SONET/SDH products.

Gross profit. Gross margin in 1998 increased to 62.3% from 58.4% in 1997. The increase in gross margin from 1997 is primarily a result of the reduction in costs of products, achieved by meeting higher volume milestones established by its foundries. Gross margin in 1997 increased to 58.4% from 29.7% in 1996. The increase was due to the lack of expenses attributable to a license agreement repurchased from Texas Instruments in December 1995 (the "TI License").

In 1998, gross profit increased to \$27.5 million as a result of the increase in overall volume and the improvement in the gross margin. In 1997, gross profit increased to \$15.8 million from \$5.8 million in 1996 as a result of the increase in overall volume and the lack of the TI License expense recognized in 1996.

Research and development. In 1998, research and development expenses were \$11.1 million, or 25.0% of total revenues, an increase of 20.2% over 1997 expenditures. In 1997, research and development expenditures were \$9.2 million, or 33.9% of total revenues, an increase of 3.3% over 1996. The increase was primarily attributable to increases in staff and in non-recurring engineering charges related to the introduction of new products during 1998 and 1997. The Company believes that the continued introduction of new products is essential to its competitiveness and is committed to continued investment in research and development. The Company believes that its research and development expenses will increase in absolute dollars in the future as it continues to add products to all of its product lines.

Marketing and sales. In 1998, marketing and sales expenses increased 30.2% to \$8.7 million and represented 19.7% of total revenues. The increase is the result of the increase in variable cost of commissions on the increased volumes and additional staff. In 1997, marketing and sales expenses increased 22.5% to \$6.7 million or 24.7% of total revenues compared to 1996. The increase is a result of the increase in variable commissions on the increased volume as well as an increase in staff in this area. The Company anticipates that it will continue to incur higher marketing and sales expenses in absolute dollars as it expands its marketing and sales efforts.

General and administrative. In 1998, general and administrative expenses increased 10.0% over 1997 to \$2.5 million, or 5.7% of total revenues. In 1997, general and administrative expenses increased 2.6% to \$2.3 million, or 8.5% of total revenues. The increase in the overall expenses was the result of TranSwitch's continued investment in the general and administrative area.

## Income taxes

The Company's effective tax rate was 4.5 percent for the year ended December 31, 1998, which reflects the estimated state and foreign income taxes.

## Liquidity and Capital Resources

The Company has financed its operations and met its capital requirements since it was incorporated in 1988 primarily through private placements of preferred stock, borrowings from a working capital line of credit and equipment financing line of credit from Silicon Valley Bank, an initial public offering of its common stock in June 1995, and cash generated from its operations. In October 1997, the Company received net proceeds of \$13.7 million in cash in connection with a private placement of its Series A Convertible Preferred Stock. All such shares had been converted into shares of common stock as of September 30, 1998. Subsequent to the end of fiscal year 1998, on February 12, 1999 and March 16, 1999, the Company completed a follow-on public offering and raised \$68.4 million, net of underwriters' commissions, and issued 1,955,000 shares of its common stock.

The Company's principal sources of liquidity as of December 31, 1998 consisted of \$27.2 million in cash, cash equivalents and short-term investments and \$10.0 million available under the Company's working capital line of credit and equipment line of credit provided by Silicon Valley Bank. As of December 31, 1998 the Company had no outstanding balance under these lines of credit. Pursuant to the working capital and equipment financing agreements with Silicon Valley Bank, the Company is restricted from further pledging its assets or granting additional security interests in such assets.

In 1998, the Company generated \$6.7 million in cash from its operations, the result of net income of \$6.0 million, \$2.4 million of depreciation and amortization and \$0.4 million in other non-cash charges, offset by a net decrease in working capital of \$2.1 million. In 1997, the Company used \$2.0 million in cash for operating activities, the result of a loss of \$1.9 million, inclusive of non-cash charges of \$1.8 million for depreciation and amortization, an increase of \$2.9 million in accounts receivable and inventory and a corresponding increase of \$1.6 million in accrued expenses. In 1996, the Company used \$2.2 million in cash for operating activities, the result of a loss of \$10.1 million, offset by non-cash charges of \$2.2 million for depreciation and amortization, a \$3.1 million write-down of the TI License, a decrease of \$2.5 million in accounts receivable and the remainder in other working capital items.

Net cash provided by financing activities consists of proceeds from the exercise of stock options and warrants of \$3.9, \$0.7 and \$0.3 million in 1998, 1997 and 1996, respectively, and net proceeds from the issuance of preferred stock of \$13.7 million in 1997.

The Company believes that its existing cash resources, cash generated from operations, and the cash raised in the follow-on public offering will fund necessary purchases of capital equipment and provide adequate working capital through the end of 1999. However, there can be no assurance that events in the future will not require the Company to seek additional capital sooner or, if so required, that such capital will be available on terms favorable or acceptable to the Company, if at all.

Inflation has not had a significant impact on the Company's operations.

## Year 2000

Many currently installed computer systems and software products are dependent upon internal calendars coded to accept only two digit entries in the date code field. These date code fields will need to accept four digit entries to distinguish 21st century dates from 20th century dates. As a result, computer systems and software used by many companies may need to be upgraded to comply with such "Year 2000" requirements.

None of TranSwitch's current products utilize internal calendars that are dependent upon the input of a specific date. As a result, all of TranSwitch's current products are inherently Year 2000 compliant.

In the fourth quarter of 1997, TranSwitch established a Year 2000 Committee (the "Committee"), chaired by the Senior Vice President and Chief Financial Officer, to assess the effects of the Year 2000 issue on operations and to remediate such effects as necessary. The Committee focuses on the Year 2000 readiness of both internal systems and key outside suppliers, financial institutions and other business partners.

To assess TranSwitch's internal readiness, the Committee has examined and tested the Company's current hardware and software to identify systems with inherent Year 2000 problems. No hardware performing critical functions has been found to have such problems. Although isolated hardware performing non-critical functions has been found to have Year 2000 problems, these problems were not judged likely to have a material impact on operations. As a result, such non-critical hardware will not be replaced.

Moreover, the Committee has obtained certificates from its software vendors to the effect that all of TranSwitch's key software systems, including its MRP, order entry and customer service systems are free of Year 2000 problems. The Committee has tested certain key software systems independently for Year 2000 functionality as well.

To assess the Year 2000 readiness of TranSwitch's key outside suppliers, financial institutions and other business partners, the Committee has requested a certification from each that it has resolved any Year 2000 issues that might have a material impact on operations. To date, approximately half of such parties have so certified.

Currently, the Committee estimates that total expenditures to assess and remedy Year 2000 issues will be less than \$50,000, plus staff time. All expenditures will be expensed when they occur and are not expected to have a material impact on results of operations. The Committee does not believe that other information technology projects will be delayed or otherwise materially affected by our Year 2000 efforts.

Based on the Committee's assessment to date, TranSwitch believes that it will not experience any material disruption in its operations as a result of Year 2000 issues. However, if certain critical vendors, service providers and business partners, such as public utilities providing electricity, water or telephone service, or financial institutions with which the Company maintains accounts, or key suppliers of parts and materials to the Company, fail to provide needed services to the Company or to its key outside suppliers or customers, customer orders could decline or the Company's operations could

shut down for as long as the failure or failures persist. At present, the Committee has not developed contingency plans, but the Committee will determine whether to develop any such plans as its assessment is completed. Accordingly, the Company cannot be certain the Year 2000 issues will not have a material adverse effect on TranSwitch's business, results of operation or financial results.

#### Certain Factors That May Affect Future Results

From time to time, information provided by the Company, statements made by its employees, or information included in its filings with the Securities and Exchange Commission (including this Form 10-K) may contain statements that are not historical facts, so-called "forward-looking statements," which involve risks and uncertainties. Such forward-looking statements are made pursuant to the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, as amended. In particular, statements in "Item 1. Business" relating to product introductions and the availability of third-party VLSI fabrication facilities, in "Item 2. Properties"

14

concerning the adequacy of the Company's current facility space and in "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" relating to anticipated levels of contract revenues and license and royalty fees, the anticipated level of foreign sales, anticipated increases in research and development and sales and marketing expenses and the availability of capital for working capital and for the purchase of capital equipment, may be forward-looking statements. The Company's actual future results may differ significantly from those stated in any forward-looking statements. Factors that may cause such differences include, but are not limited to, the factors discussed below. Each of these factors, and others, are discussed from time-to-time in the Company's filings with the Securities and Exchange Commission.

Potential Fluctuations in Operating Results. The Company's quarterly and annual operating revenues, expenses and operating results may fluctuate due to a number of factors including:

- . the timing and cancellation of customer orders;
- . market acceptance of the Company's and customers' products;
- . competitive pressures on selling prices; and
- . general economic conditions.

Management of Growth and Dependence on Key Personnel. TranSwitch must attract and retain highly qualified and well-trained personnel, including senior managers. Competition for such employees is intense, and it may become increasingly difficult for the Company to hire and retain such personnel.

TranSwitch Depends on a Few Outside Fabrication Facilities. The Company does not own or operate a Very Large Scale Integrated (VLSI) circuit fabrication facility and depends upon four foundries for most of its semiconductor device requirements. The Company cannot be certain that it will be able to renew or maintain contracts with these foundries on terms as favorable as current contract terms. There are other significant risks associated with reliance on a few outside foundries, including:

- . the lack of assured semiconductor wafer supply and control over delivery schedules;
- . the unavailability of, or delays in obtaining access to, key process technologies; and
- . limited control over quality assurance, manufacturing yields and production costs.

Dependence on Telecommunications, Internet and Wide Area Communications Markets. The Company derives virtually all of its product revenues from sales of products to the telecommunications, Internet and wide area communications markets, which are characterized by intense competition, rapid technological change and short product life cycles. Although the telecommunications, Internet and wide area communications equipment markets have grown rapidly in the last few years, they may not continue to grow, or a significant slowdown in these markets may occur.

Dependence on New Products; Risk of Product Development Delays. The development of new VLSI devices is highly complex, and from time-to-time, the Company has experienced delays in completing the development of new products.

Customer Concentration. Historically, a relatively small number of customers have accounted for a significant portion of the Company's total revenues in any particular period and probably will continue to do so.

TranSwitch's Success Depends on Intellectual Property. The Company's success depends in part on its ability to obtain patents and licenses and to preserve other intellectual property rights covering its products and development and testing tools. The Company cannot ensure that:

- . patents be will issued from currently pending or future applications;
- . its existing patents or any new patents will be sufficient in scope or strength to provide meaningful protection or any commercial advantage;

15

- . foreign intellectual property laws will protect the Company's intellectual property rights; or
- . others will not independently develop similar products, duplicate the Company's products or design around any patents issued to the Company.

In addition, the Company may be unknowingly infringing on the proprietary rights of others and may be liable for that infringement, which could result in significant liability.

Competition. The semiconductor industry is intensely competitive and is characterized by factors likely to result in pricing pressures on the Company's products.

Foreign Sales. TranSwitch expects foreign sales to continue to account for a significant percentage of revenues. A significant portion of total revenues will therefore be subject to risks associated with foreign sales. In particular, sales to Pacific Rim countries may be impacted by the current financial instability plaguing these nations.

The Semiconductor Industry. TranSwitch provides semiconductor devices to telecommunications and data communications OEMs. The semiconductor industry is highly cyclical and has been subject to significant economic downturns at various times.

Year 2000. None of the Company's current products utilize internal calendars that are dependent upon the input of a specific date. As a result, all of the Company's current products are inherently Year 2000 compliant. Moreover, based on assessments made to date, TranSwitch does not anticipate material disruptions to operations as a result of Year 2000 issues.

However, if certain critical vendors, service providers or business partners, such as foundries, public utilities providing electricity, water or telephone service, financial institutions with whom the Company maintains accounts or key suppliers of its parts and materials fail to provide needed services to the Company, or customers, customer orders could decline or the Company's operations could shut down for as long as the failure or failures persist. At present, the Company has not developed contingency plans, but will determine whether to develop any such plans as the assessment of Year 2000 is completed. Accordingly, the Company cannot be certain that Year 2000 issues will not adversely affect its business, results of operations and financial results.

#### ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Not applicable.

#### ITEM 8. CONSOLIDATED FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The information required by this Item is contained in the financial statements and schedule set forth in Item 14 (a) of this Form 10-K.

#### ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

There has been no change of accountants nor any disagreements with accountants on any matter of accounting principles or practices or financial statement disclosure required to be reported under this Item.

16

### PART III

#### ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF THE REGISTRANT

The information required by this Item is incorporated herein by reference to the information in the sections entitled "Election of Directors," "Occupations of Directors and Executive Officers" and "Compensation and Other Information Concerning Directors and Officers" contained in the Company's definitive proxy statement to be filed with the Securities and Exchange Commission not later than 120 days after the close of the fiscal year ended December 31, 1998.

#### ITEM 11. EXECUTIVE COMPENSATION

The information required by this Item is incorporated herein by reference to the information in the section entitled "Compensation and Other Information Concerning Directors and Executive Officers" contained in the Company's

definitive proxy statement to be filed with the Securities and Exchange Commission not later than 120 days after the close of the fiscal year ended December 31, 1998.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The information required by this Item is incorporated herein by reference to the information in the section entitled "Management and Principal Stockholders" contained in the Company's definitive proxy statement to be filed with the Securities and Exchange Commission not later than 120 days after the close of the fiscal year ended December 31, 1998.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS

None.

PART IV

ITEM 14. EXHIBITS, FINANCIAL STATEMENT SCHEDULES, AND REPORTS ON FORM 8-K

(a) 1. Consolidated Financial Statements

For the following financial information included herein, see Index on page F-1:

Independent Auditors' Report.

Consolidated Balance Sheets as of December 31, 1998 and December 31, 1997.

Consolidated Statements of Operations for each of the years in the three-year period ended December 31, 1998.

Consolidated Statements of Stockholders' Equity (Deficit) for each of the years in the three-year period ended December 31, 1998.

Consolidated Statements of Cash Flows for each of the years in the three-year period ended December 31, 1998.

Notes to Consolidated Financial Statements.

2. Financial Statement Schedule

The following financial statement schedule is included herein:

Schedule II Valuation and Qualifying Accounts.

All other schedules are not submitted because they are not applicable, not required or because the information is included in the Consolidated Financial Statements or Notes to Consolidated Financial Statements.

17

3. Exhibits

<TABLE>

<CAPTION>

Exhibit  
Number

Description

<C>

<S>

3.1*	Amended and Restated Certificate of Incorporation of the Company
3.2*	By-laws, as amended and restated, of the Company
4.1*	Specimen certificate representing the Common Stock
4.2*	Fourth Amended and Restated Registration Rights Agreement
4.3+	Certificate of Designations, Preferences and Rights of Series A Preferred Stock
4.4+	Form of Stock Purchase Agreement, dated October 10, 1997 among the

Company and the purchasers of Series A Convertible Preferred Stock

10.1*	1989 Stock Option Plan
10.2++	Third Amended and Restated 1995 Stock Plan
10.3*	1995 Employee Stock Purchase Plan
10.4++	1995 Non-Employee Director Stock Option Plan, as amended
10.5*	Form of Incentive Stock Option Agreement for 1989 Stock Option Plan
10.6*	Form of Non-Qualified Stock Option Agreement for 1989 Stock Option Plan
10.7***	Form of Incentive Stock Option Agreement under the 1995 Stock Plan of the Company
10.8***	Form of Non-Qualified Stock Option Agreement under the 1995 Stock Plan of the Company
10.9***	1995 Employee Stock Purchase Plan Enrollment/Authorization Form of the Company
10.10***	Form of Non-Qualified Stock Option Agreement under the 1995 Non-Employee Director Stock Option Plan of the Company
#10.11*	Agreement with Texas Instruments Incorporated
10.12*	Authorized Distributor Agreement with Insight Electronics, Inc.
10.13*	Development Agreement with Connecticut Innovations, Incorporated
10.14*****	Lease Agreement, as amended, with Robert D. Scinto
10.15**	Amended and Restated Promissory Note (Working Capital Line of Credit) with Silicon Valley Bank
10.16**	Amended and restated Promissory Note (Equipment Line of Credit) with Silicon Valley Bank
10.17*	Commitment Letter, as amended, from Silicon Valley Bank
10.18*	Security Agreement with Silicon Valley Bank
10.19+++	Silicon Valley Bank Loan Modification Agreement
10.20*	Development and License Agreement with Adaptive Corporation
10.21*	OEM Agreement for Acquisition of IBM Products with International Business Machines Corporation
#10.22*	License Agreement with StrataCom, Inc.
#10.23****	Agreement with Texas Instruments Incorporated
#10.24****	Integrated Circuit Foundry Agreement with Texas Instruments Incorporated
10.25**	Sixth Loan Modification Agreement
10.26**	Negative Pledge Agreement
21.1**	Subsidiaries of the Company
23.1**	Consent of KPMG LLP
27.1**	Financial Data Schedule

</TABLE>

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- # Confidential treatment obtained as to certain portions.
- \* Previously filed as an exhibit to the Company's Registration Statement on Form S-1 (File No. 33-91694) and incorporated herein by reference.
- + Previously filed as an exhibit to the Company's Registration Statement on Form S-3 (File No. 333-40897) and incorporated herein by reference.
- ++ Previously filed as an exhibit to the Company's Definitive Proxy Statement on Schedule 14A dated April 20, 1998 and incorporated herein by reference.
- +++ Previously filed as an exhibit to the Company's Form 10-Q for the quarter ended September 30, 1997 and incorporated herein by reference.
- \*\* Filed herewith.

\*\*\* Previously filed as an exhibit to the Company's Registration Statement



on Form S-8 (File No. 33-94324) and incorporated herein by reference.  
\*\*\*\* Previously filed as an exhibit to the Company's Annual Report on Form  
10-K for the fiscal year ended December 31, 1995  
\*\*\*\*\* Previously filed as an exhibit to the Company's Annual Report on Form  
10-K for the fiscal year ended December 31, 1997.

(b) Reports on Form 8-K

No reports on Form 8-K were filed by the Company during the fourth quarter ended December 31, 1998. On January 21, 1999, the Company filed a Form 8-K reporting its unaudited financial results for its fourth quarter and the fiscal year ended December 31, 1998. On January 28, 1999, the Company filed a Form 8-K/A supplementing the aforementioned Form 8-K.

(c) Exhibits

The Company hereby files, as exhibits to this Form 10-K, those exhibits listed in Item 14 (a) (3) above.

(d) Financial Statement Schedule

The Company hereby files, as a financial statement schedule to this Form 10-K, the financial statement schedule listed in Item 14(a) (2) above.

19

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Company has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

March 26, 1999

TranSwitch Corporation

by: /s/ Dr. Santanu Das

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Name: Dr. Santanu Das

Title: Chairman of the Board,  
President and Chief Executive  
Officer

POWER OF ATTORNEY AND SIGNATURES

We, the undersigned officers and directors of TranSwitch Corporation, hereby severally constitute and appoint Santanu Das and Michael McCoy, and each of them singly, our true and lawful attorneys, with full power to them and each of them singly, to sign for us in our names in the capacities indicated below, all amendments to this report, and generally to do all things in our names and on our behalf in such capacities to enable TranSwitch Corporation to comply with the provisions of the Securities Exchange Act of 1934, as amended and all requirements of the Securities and Exchange Commission.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Company and in the capacities and on the dates indicated.

<TABLE>  
<CAPTION>

Name and Signature  
-----

Title(s)  
-----

Date  
-----

<S>	/s/ Dr. Santanu Das	<C>	<C>
	----- Dr. Santanu Das	Chairman of the Board, President, and Chief Executive Officer (principal executive officer)	March 26, 1999
	/s/ Michael F. Stauff	Senior Vice President, Chief Financial Officer and Treasurer (principal financial and accounting officer)	March 26, 1999
	----- Michael F. Stauff		
	/s/ Alfred R. Boschulte	Director	March 26, 1999
	----- Alfred R. Boschulte		
	/s/ Dr. Steward S. Flaschen	Director	March 26, 1999
	----- Dr. Steward S. Flaschen		

</TABLE>

20

<TABLE>  
<CAPTION>

Name and Signature  
-----

Title(s)  
-----

Date  
-----

<S>	/s/ Dr. Charles Lee	<C>	<C>
	----- Dr. Charles Lee	Director	March 26, 1999
	/s/ Dr. Ljubomir Micic.	Director	March 26, 1999
	----- Dr. Ljubomir Micic		
	/s/ Dr. Albert E. Paladino	Director	March 26, 1999
	----- Dr. Albert E. Paladino		

</TABLE>

<TABLE>  
<S>

<C>

<C>

Erik van der Kaay

</TABLE>

TRANSWITCH CORPORATION AND SUBSIDIARIES  
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

<TABLE>  
<CAPTION>

	Page
	----
<S>	<C>
Report of Independent Auditors.....	F-2
Consolidated Balance Sheets as of December 31, 1998 and 1997.....	F-3
Consolidated Statements of Operations for each of the years in the three-year period ended December 31, 1998.....	F-4
Consolidated Statements of Stockholders' Equity for each of the years in the three-year period ended December 31, 1998.....	F-5
Consolidated Statements of Cash Flows for each of the years in the three-year period ended December 31, 1998 .....	F-6
Notes to Consolidated Financial Statements.....	F-7

</TABLE>

REPORT OF INDEPENDENT AUDITORS

The Board of Directors and Shareholders of TranSwitch Corporation:

We have audited the accompanying consolidated balance sheets of TranSwitch Corporation and subsidiaries as of December 31, 1998 and 1997, and the related consolidated statements of operations, stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 1998. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of TranSwitch Corporation and subsidiaries as of December 31, 1998 and 1997, and the results of their operations and their cash flows for each of the years in the three-year period ended December 31, 1998 in conformity with generally accepted accounting principles.

## TRANSWITCH CORPORATION AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS  
(in thousands, except share data)

&lt;TABLE&gt;

&lt;CAPTION&gt;

	December 31,	
	1998	1997
<S>	<C>	<C>
<b>ASSETS</b>		
Current assets:		
Cash and cash equivalents.....	\$24,243	\$20,508
Short-term investments.....	2,953	1,110
Accounts receivable, less allowance for doubtful accounts of \$261 in 1998 and \$218 in 1997.....	7,624	4,528
Inventories, net.....	5,476	4,812
Prepaid expenses and other current assets.....	917	815
	-----	-----
Total current assets.....	41,213	31,773
Property and equipment, net.....	5,143	3,816
Product licenses and other assets, net.....	1,453	1,000
	-----	-----
Total assets.....	\$47,809	\$36,589
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
Current liabilities:		
Accounts payable.....	\$ 2,858	\$ 1,350
Accrued expenses.....	1,218	1,534
Accrued compensation.....	1,366	993
Sales allowance reserve.....	1,049	649
Warranty reserve.....	661	532
Product license fee payable, current portion.....	303	1,067
	-----	-----
Total current liabilities.....	7,455	6,125
Product license fee payable, less current portion.....	--	303
Commitments and contingencies (Note 11)		
Stockholders' equity:		
Preferred Stock, \$.01 par value, authorized 1,000,000:		
Convertible Preferred Stock, issued and outstanding, none in 1998 and 14,500 shares in 1997.....	--	14,357
Common Stock, \$.001 par value authorized 25,000,000 shares: issued and outstanding 14,678,531 shares in 1998 and 12,318,271 shares in 1997.....		
	15	12
Additional paid-in capital.....	64,297	45,753
Accumulated deficit.....	(23,958)	(29,961)
	-----	-----
Total stockholders' equity.....	40,354	30,161

Total liabilities and stockholders' equity.....	\$47,809	\$36,589
	=====	=====

</TABLE>

See accompanying notes to consolidated financial statements.

F-3

TRANSWITCH CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF OPERATIONS  
(in thousands, except per share amounts)

<TABLE>

<CAPTION>

	Year Ended December 31,		
	1998	1997	1996
	-----	-----	-----
<S>	<C>	<C>	<C>
Revenues:			
Product revenues, net.....	\$44,169	\$26,930	\$ 19,236
Research and development contracts.....	--	154	414
	-----	-----	-----
Total revenues.....	44,169	27,084	19,650
	-----	-----	-----
Cost of revenues:			
Cost of products sold.....	16,645	11,254	10,615
Write-down of product license.....	--	--	3,128
Cost of research and development contracts.....	--	--	63
	-----	-----	-----
Total cost of revenues.....	16,645	11,254	13,806
	-----	-----	-----
Gross profit.....	27,524	15,830	5,844
	-----	-----	-----
Operating expenses:			
Research and development.....	11,053	9,194	8,928
Marketing and sales.....	8,699	6,681	5,454
General and administrative.....	2,516	2,288	2,229
	-----	-----	-----
Total operating expenses.....	22,268	18,163	16,611
	-----	-----	-----
Operating income (loss).....	5,256	(2,333)	(10,767)
	-----	-----	-----
Interest income (expense):			
Interest income.....	1,121	641	819
Interest expense.....	(90)	(181)	(129)
	-----	-----	-----
Interest income, net.....	1,031	460	690
	-----	-----	-----
Income (loss) before income taxes.....	6,287	(1,873)	(10,077)
Income tax expense.....	284	--	--
	-----	-----	-----
Net income (loss).....	\$ 6,003	\$ (1,873)	\$ (10,077)
	=====	=====	=====
Basic earnings (loss) per share (Note 9).....	\$ 0.43	\$ (0.15)	\$ (0.86)
	=====	=====	=====

Diluted earnings (loss) per share (Note 9)..... \$ 0.40 \$ (0.15) \$ (0.86)  
=====

</TABLE>

See accompanying notes to consolidated financial statements

F-4

TRANSWITCH CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY  
(in thousands, except share data)

<TABLE>

<CAPTION>

	Common Stock		Convertible Preferred Stock	Additional Paid-in Capital	Accumulated Deficit	Total
	Shares	Amount				
	<C>	<C>	<C>	<C>	<C>	<C>
Balance at December 31, 1995.....	11,503,606	\$12	\$ --	\$44,705	\$(18,011)	\$26,706
Shares of common stock issued in connection with the exercise of stock options and warrants, and the stock purchase plan.....	408,880	--	--	319	--	319
Compensation related to issuance of stock options.....	--	--	--	351	--	351
Net loss.....	--	--	--	--	(10,077)	(10,077)
Balance at December 31, 1996.....	11,912,486	12	--	45,375	(28,088)	17,299
Shares of common stock issued in connection with the exercise of stock options and warrants, and the stock purchase plan.....	405,785	--	--	699	--	699
Issuance of convertible preferred stock, net of issuance costs.....	--	--	12,886	770	--	13,656
Deemed dividend on convertible preferred stock.....	--	--	1,471	(1,471)	--	--
Compensation related to issuance of stock options.....	--	--	--	380	--	380
Net loss.....	--	--	--	--	(1,873)	(1,873)
Balance at December 31, 1997.....	12,318,271	12	14,357	45,753	(29,961)	30,161
Shares of common stock issued in connection with the exercise of stock options and the						

stock purchase plan....	781,485	1		3,880	--	3,881
Deemed dividend on convertible preferred stock.....	--	--	143	(143)	--	--
Issuance costs for convertible preferred stock.....	--	--	--	(75)	--	(75)
Shares of common stock issued upon conversion of preferred stock.....	1,578,775	2	(14,500)	14,498	--	--
Compensation related to issuance of stock options.....	--	--	--	384	--	384
Net income.....	--	--	--	--	6,003	6,003
	-----	---	-----	-----	-----	-----
Balance at December 31, 1998.....	14,678,531	\$15	\$ --	\$64,297	\$ (23,958)	\$40,354
	=====	===	=====	=====	=====	=====

</TABLE>

See accompanying notes to consolidated financial statements.

F-5

TRANSWITCH CORPORATION AND SUBSIDIARIES

CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)

<TABLE>

<CAPTION>

	Years Ended December 31,		
	1998	1997	1996
	-----	-----	-----
<S>	<C>	<C>	<C>
Cash flows from operating activities:			
Net income (loss).....	\$ 6,003	\$ (1,873)	\$ (10,077)
	-----	-----	-----
Adjustments required to reconcile net income (loss) to cash flows from operating activities:			
Depreciation and amortization.....	2,445	1,807	2,195
Write-down of product license.....	--	--	3,128
Stock compensation expense.....	384	380	351
Changes in assets and liabilities:			
Decrease (increase) in accounts receivable...	(3,096)	(1,635)	2,487
(Increase) in inventories.....	(664)	(1,288)	(753)
Decrease (increase) in prepaids and other current assets.....	(413)	(510)	194
Increase (decrease) in accounts payable.....	1,508	(455)	(216)
Increase in accrued expenses and other liabilities.....	564	1,598	516
	-----	-----	-----
Total adjustments.....	728	(103)	7,902
	-----	-----	-----
Net cash provided by (used in) operating			

activities.....	6,731	(1,976)	(2,175)
	-----	-----	-----
Cash flows from investing activities:			
Purchase of product licenses.....	(550)	(3)	(445)
Capital expenditures.....	(3,364)	(2,719)	(1,892)
Purchases of short-term investments.....	(6,405)	(8,615)	(24,057)
Proceeds from maturities of short-term investments.....	4,562	16,282	18,900
	-----	-----	-----
Net cash provided by (used in) investing activities.....	(5,757)	4,945	(7,494)
	-----	-----	-----
Cash flows from financing activities:			
Payments on product license obligations.....	(1,045)	(727)	(369)
Proceeds from the exercise of stock options and warrants.....	3,881	699	319
Proceeds from the issuance of convertible preferred stock, net of issuance costs.....	(75)	13,656	--
	-----	-----	-----
Net cash provided by (used in) financing activities.....	2,761	13,628	(50)
	-----	-----	-----
Increase (decrease) in cash and cash equivalents...	3,735	16,597	(9,719)
Cash and cash equivalents at beginning of year.....	20,508	3,911	13,630
	-----	-----	-----
Cash and cash equivalents at end of year.....	\$24,243	\$20,508	\$ 3,911
	=====	=====	=====
Supplemental disclosure of cash flows information:			
Cash paid for interest.....	\$ 109	\$ 181	\$ 129
Cash paid for income taxes.....	\$ 214	\$ 30	\$ --
Supplemental schedule of non-cash financing activities:			
Obligations for purchase of product licenses.....	\$ --	\$ --	\$ 134

</TABLE>

See accompanying notes to consolidated financial statements.

F-6

## TRANSWITCH CORPORATION AND SUBSIDIARIES

### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (in thousands, except share and per share amounts)

#### (1) Summary of Significant Accounting Policies

##### Description of Business

TranSwitch Corporation (the "Company") was incorporated in Delaware on April 26, 1988. The Company has two wholly-owned subsidiaries: TranSwitch Europe N.V./S.A. in Brussels, Belgium and TranSwitch India Private Limited in New Delhi, India. The Company designs, develops, markets and supports highly integrated digital and mixed-signal semiconductor solutions for the telecommunications and data communications markets.

##### Principles of Consolidation

The consolidated financial statements include the accounts of the Company



and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

#### Reclassifications

Certain prior year amounts have been reclassified to conform with the current year's presentation.

#### Cash Equivalents

Cash equivalents of \$13,262 and \$18,668 at December 31, 1998 and 1997, respectively, consist of certificates of deposit, U.S. Treasury Bills, commercial paper and U.S. Agency notes. For purposes of the statements of cash flows, the Company considers all certificates of deposit, U.S. Treasury Bills, commercial paper and U.S. Agency notes with original maturities of three months or less to be cash equivalents.

#### Short-term Investments

Short-term investments at December 31, 1998 and 1997 consist of U.S. Treasury Bills, commercial paper and corporate debt securities with maturities of less than one year from the balance sheet date. The Company classifies its securities as held-to-maturity. Held-to-maturity securities are those securities in which the Company has the ability and intent to hold the securities to maturity. These securities are recorded at amortized cost, adjusted for the amortization or accretion of premiums or discounts.

Gross realized gains and losses on sales of securities in 1998 and 1997 were immaterial.

#### Inventories

Inventories are carried at the lower of cost (on a first-in, first-out basis) or estimated net realizable value.

#### Property and Equipment

Property and equipment are carried at cost less accumulated depreciation. Depreciation of property and equipment is provided on the half-year convention method based on the related assets estimated useful lives, ranging from three to seven years. Depreciation of semiconductor tooling costs is provided on the straight-line method using the lesser of three years or the life of the related semiconductor it produces. Repairs and maintenance are charged to operations as incurred.

#### Product Licenses

Product licenses are amortized over the lesser of the Company's estimated product sales volume or the straight-line method over three to five years.

F-7

### TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

Subsequent to its acquisition, the Company continually evaluates whether events and circumstances have occurred that indicate the remaining estimated useful life of a product license may warrant revision or that the remaining balance of a product license may not be recoverable. When factors indicate that a product license should be evaluated for possible impairment, the Company uses an estimate of the related product licenses' undiscounted future cash flows over the remaining life of the asset in measuring whether the product license is recoverable. Any impairment is measured against discounted cash flows.

#### Revenue Recognition

Sales of product are recognized upon shipment to distributors and original equipment manufacturers. Sales to certain distributors are made under distributor agreements that provide the distributor with certain price protection and return and allowance rights. Revenues are reduced for estimated price protection and returns based upon historical experience.

Revenues from development contracts are derived from agreements with third parties. These agreements provide for payments to the Company for the development of new products and reimbursement for expenses incurred based on the achievement of certain milestones. Revenues are recognized as the related costs are incurred over the term of the agreement. The Company primarily retains exclusive ownership of technology developed in connection with the design of semiconductors. Technology developed in connection with customized computer boards generally transfers to third parties.

#### Concentration of Credit Risk

The Company sells its products to customers in the United States and overseas. Credit evaluations are done on all new customers and periodically evaluated for existing customers. The Company establishes an allowance for doubtful accounts based upon factors surrounding the credit risk of specific customers, historical trends and other information.

#### Product Warranties

The Company provides for expected costs that may be incurred under its product warranties. Estimated warranty costs are accrued as products are sold and charged to cost of revenues.

#### Research and Development Costs

Research and development costs are expensed as incurred.

#### Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

Earnings per Share

Basic earnings per share are based upon the weighted average common shares outstanding during the period. Diluted earnings per share assume exercise of in-the-money stock options outstanding and full conversion of convertible preferred stock into common stock at the beginning of the period or the date of issuance, unless they are antidilutive.

Use of Estimates

Management of the Company has made a number of estimates and assumptions relating to the reporting of assets and liabilities and the disclosure of contingent liabilities to prepare these financial statements in conformity with generally accepted accounting principles. Actual results could differ from those estimates.

Accounting Changes

Effective January 1, 1998, the Company adopted Statement of Financial Accounting Standards (SFAS) No. 130, "Reporting Comprehensive Income." This statement requires that companies disclose comprehensive income, which includes net income and other comprehensive income, such as foreign currency translation adjustments, minimum pension liability adjustments, and unrealized gains and losses on marketable securities classified as available-for-sale. For the Company, comprehensive income (loss) is the same as net income (loss).

Effective December 1998, the Company adopted SFAS No. 131, "Disclosures about Segments of an Enterprise and Related Information." SFAS No. 131 requires companies to report segment information as it is used internally to assess performance and allocate resources. See Note 6.

In June 1998, the Financial Accounting Standards Board issued SFAS No. 133, "Accounting for Derivative Instruments and Hedging Activities." SFAS No. 133 requires companies to recognize all derivatives as assets or liabilities measured at their fair value. Gains or losses resulting from changes in the value of those derivatives would be accounted for depending on the use of the derivative and whether it qualifies for hedge accounting. The Company has not yet made a determination of the impact of this accounting standard. This statement is effective for fiscal years beginning after June 15, 1999. We will adopt this accounting standard beginning January 1, 2000.

(2) Fair Value of Financial Instruments

The carrying amounts for cash and cash equivalents, short-term investments, and accounts receivables, net, approximate fair value because of the short maturities of these instruments.

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist principally of cash and trade accounts receivable.

The Company places its cash primarily in market interest rate accounts. The

Company, by policy, limits the amount of credit exposure to any one financial institution or commercial issuer.

(3) Inventories

The components of inventories at December 31, 1998 and 1997 follow:

<TABLE>

<CAPTION>

	1998	1997
	-----	-----
<S>	<C>	<C>
Raw materials.....	\$ 947	\$ 1,086
Work in process.....	809	1,654
Finished goods.....	3,720	2,072
	-----	-----
Total inventories.....	\$ 5,476	\$ 4,812
	=====	=====

</TABLE>

F-9

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

(4) Property and Equipment, Net

The components of property and equipment, net at December 31, 1998 and 1997 follow:

<TABLE>

<CAPTION>

	Estimated Useful Lives	1998	1997
		-----	-----
<S>	<C>	<C>	<C>
Purchased computer software.....	3 years	\$ 4,732	\$ 4,220
Equipment.....	3-7 years	4,947	3,171
Semiconductor tooling.....	3 years	998	879
Furniture.....	3-7 years	1,120	967
Leasehold improvements.....	Lease term	196	186
Construction in progress.....		789	106
		-----	-----
		12,782	9,529
Less accumulated depreciation and amortization.....		(7,639)	(5,713)
		-----	-----
Property and equipment, net.....		\$ 5,143	\$ 3,816
		=====	=====

</TABLE>

(5) Product Licenses, Net

Product licenses, net, amounted to \$1,142 and \$1,000 at December 31, 1998 and 1997, respectively.

On December 15, 1995 the Company entered into a new agreement with Texas Instruments (TI) in which it repurchased its license agreement for a total of \$4,875 representing an upfront payment of \$2,125 in cash and the discounted present value of future minimum payments. The Company recorded the repurchased license (TI License) in its consolidated balance sheet under the caption product licenses and is amortizing the asset over a five year period based upon the estimated related incremental product sales. Interest expense is being accrued over the three year minimum payment period.

In the fourth quarter of 1996, the TI License was written down to its net realizable value as the forecasted incremental revenues attributable to the TI License were significantly less than originally anticipated.

The Company purchased other product licenses during 1998 and 1997 for \$550 and \$3, respectively, which are being amortized over a three year period.

Amortization of product licenses amounted to \$408, \$257 and \$705 in 1998, 1997 and 1996, respectively.

#### (6) Segment Reporting

In 1998, the Company adopted SFAS No. 131, "Disclosures about Segments of an Enterprise and Related Information." SFAS No. 131 establishes standards for reporting information about operating segments in annual financial statements and requires that certain selected information about operating segments be reported in interim financial reports. It also establishes standards for related disclosures about products and services and geographic areas. Operating segments are defined as components of an enterprise about which separate financial information is evaluated regularly by the chief operating decision maker, or decision making group, in deciding how to allocate resources and in assessing performance. The Company's chief operating decision maker is our Chief Executive Officer. SFAS No. 131 differs from the previous accounting standard SFAS No. 14, which required companies to disclose certain financial information about an industry segment in which they operate. Under both SFAS No. 14 and SFAS No. 131, we have one segment: Communication Semiconductor Products.

F-10

### TRANSWITCH CORPORATION AND SUBSIDIARIES

#### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued) (in thousands, except share and per share amounts)

#### Products and Services

TranSwitch products are Very Large Scale Integrated (VLSI) semiconductor solutions that provide core functionality of communications network equipment. The integration of various technologies and standards in these solutions result in a homogeneous product line for management and measurement purposes.

#### Information about Geographic Areas

The following revenues from external customers is based on the geographic location of the Company's customers. All sales are exported from the United States and are denominated in U.S. dollars.

<TABLE>  
<CAPTION>

	Revenues		
	Years Ended December 31,		
	1998	1997	1996
<S>	<C>	<C>	<C>
United States.....	\$23,689	\$18,059	\$10,750
Israel .....	5,772	517	4,232
China.....	7,175	1,831	426
Other areas.....	7,533	6,677	4,242
Total revenues.....	\$44,169	\$27,084	\$19,650

</TABLE>

Export revenues represented 46%, 33% and 46% of total revenues in 1998, 1997 and 1996, respectively.

Long-lived assets of the Company are located in the following areas at December 31, 1998, 1997, and 1996, respectively:

<TABLE>  
<CAPTION>

	Long-lived Assets		
	December 31,		
	1998	1997	1996
<S>	<C>	<C>	<C>
United States.....	\$4,677	\$3,499	\$2,256
Foreign countries .....	466	317	391
Total long-lived assets.....	\$5,143	\$3,816	\$2,647

</TABLE>

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

Information about Major Customers

The percentage of total revenues attributable to the Company's significant customers for the years ended December 31, 1998, 1997 and 1996 follow:

<TABLE>  
<CAPTION>

Years Ended  
December 31,

	1998	1997	1996
<C>	<C>	<C>	<C>
Insight Electronics, Inc. (1)	20%	41%	16%
Columbia Technologies (1)	15%	*	*
Tellabs Operations, Inc. (2)	21%	16%	14%
ECI Telecom Ltd.	*	*	22%

</TABLE>

(1) Insight Electronics, Inc. and Columbia Technologies are distributors to various end-users, none of which comprised more than 10% of the Company's total revenue during the respective periods.

(2) The Company's sales to Tellabs Operations, Inc. during 1998 were made through Repton Electronics, Inc. and Arrow Electronics, Inc., which are Tellabs' designated distributors. In 1997 and 1996 sales to Tellabs were made through Repton Electronics, Inc. only. The remaining end users to which Arrow sells do not compromise more than 10% of the Company's end users.

\* Revenues were less than 10% of the Company's total revenues in these years.

(7) Income Taxes

The components of 1998 income before income taxes are as follows:

<TABLE>

<CAPTION>

<S>	<C>
Domestic income	\$6,212
Foreign income	75
Income before income taxes	\$6,287

</TABLE>

The provision for income taxes is comprised of the following:

<TABLE>

<CAPTION>

Years Ended December 31,

	1998	1997	1996
<S>	<C>	<C>	<C>
Federal income taxes			
Current	\$ 161	\$ --	\$ --
Deferred	(161)	--	--
State income taxes			
Current	252	--	--
Deferred	--	--	--
Foreign income taxes			
Current	32	--	--
Deferred	--	--	--
Income taxes	\$ 284	\$ --	\$ --

</TABLE>

## TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

The tax effect of temporary differences that give rise to deferred tax assets and deferred tax liabilities at December 31, 1998 and 1997 are presented below:

&lt;TABLE&gt;

&lt;CAPTION&gt;

	1998	1997
	-----	-----
<S>	<C>	<C>
Deferred tax assets:		
Property and equipment.....	\$ 160	\$ --
Nondeductible reserves.....	1,710	1,160
Net operating losses.....	10,333	12,244
Research and development credit.....	2,429	1,860
Other.....	366	90
	-----	-----
Total gross deferred tax assets.....	14,998	15,137
Less valuation allowance.....	(14,825)	(14,867)
	-----	-----
Net deferred tax assets.....	173	487
	-----	-----
Deferred tax liabilities:		
Property and equipment.....	--	(70)
Inventory.....	--	(217)
Product license.....	(125)	(200)
	-----	-----
Total gross deferred tax liabilities.....	(125)	(487)
	-----	-----
Total deferred taxes, net of valuation allowance.....	\$ 48	\$ --
	=====	=====

&lt;/TABLE&gt;

The net change in the total valuation allowance for the year ended December 31, 1998 was a net decrease of \$42. Due to the Company's operating losses from inception through 1997, there is uncertainty surrounding whether the Company will ultimately realize its deferred tax assets. Accordingly, these assets have been fully reserved. Of the total valuation allowance of \$14,825, subsequently recognized tax benefits, if any, in the amount of \$4,000 will be applied directly to contributed capital. This amount relates to the tax effect of employee stock option deductions included in the Company's net operating loss ("NOL") carryforward.

At December 31, 1998, the Company had available, for federal income tax purposes, NOL carryforwards of approximately \$26,422 and research and development tax credit carryforwards of approximately \$2,243 expiring in varying amounts from 2003 through 2018.

Certain transactions involving beneficial ownership of the Company have occurred that resulted in a stock ownership change for purposes of Section 382 of the Internal Revenue Code of 1986, as amended. Consequently, approximately



\$21,623 of the Company's NOL carryforward and \$1,410 of the Company's research and development tax credit carryforward are subject to these limitations.

The difference between the statutory federal income tax rate and the Company's effective tax rate for the years ended December 31, 1997 and 1996 is principally due to net operating losses. The following table summarizes the differences between the U.S. Federal statutory rate and the Company's effective tax rate for financial statement purposes for the year ended December 31, 1998:

<TABLE>

<CAPTION>

<S>	<C>
U.S federal statutory tax rate.....	34.0%
State taxes.....	4.0
Utilization of NOL.....	(34.4)
Permanent differences and other.....	0.9
	-----
Effective income tax rate.....	4.5%
	=====

</TABLE>

F-13

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

The Company has sufficient NOL carryforwards to offset current taxable income before any tax deductions attributable to employee stock options. Accordingly, no federal income tax expense is allocated to income from operations in 1998.

(8) Stockholders' Equity

Convertible Preferred Stock

On October 10, 1997, the Company issued 14,500 shares of Series A Convertible Preferred Stock (Series A Stock) for net proceeds, after issuance costs, of \$13,656. The Company allocated \$1,614 of the net proceeds to additional paid-in capital, representing the calculated value of a preferential conversion feature on the date of issuance. This amount was accreted ratably to the Series A Stock as a deemed dividend through the earliest conversion date.

Each share of Series A Stock is convertible into shares of Common Stock at any time at the option of the holder, subject to certain limitations, at the lesser of (i) \$10.58 per share or (ii) ninety percent (90%) of the average of the closing bid price of the Company's Common Stock, as reported by the NASDAQ National Market, for the ten (10) trading days immediately preceding the date written notice of conversion is received by the Company. Unless converted sooner at the option of the holders of the Series A Stock, all shares of Series A Stock will convert to Common Stock on October 10, 2002. No Series A Stock may be converted until the earlier of (i) January 8, 1998 or (ii) the date upon which a registration statement filed with the Securities and Exchange Commission to register additional common shares is declared

effective.

As of December 31, 1997, the Series A Stock was not yet eligible for conversion into Common Stock. Effective January 8, 1998, the Series A Stock was eligible for conversion into Common Stock.

As of December 31, 1998, all outstanding shares of Series A Stock had been converted into 1,578,755 shares of Common Stock.

#### Stock Based Compensation

##### 1995 Employee Stock Purchase Plan

On April 11, 1995, the Company's Board of Directors adopted the 1995 Employee Stock Purchase Plan (the "1995 Purchase Plan"), which was approved by the Company's stockholders on April 19, 1995. Under the terms of the 1995 Purchase Plan, all employees of the Company, except employees who own five percent or more of Common Stock, may contribute to the plan up to 5% of their annual compensation toward the purchase of the Company's Common Stock. The Company has reserved 100,000 shares for issuance under the 1995 Purchase Plan. The purchase price per share is the lesser of (a) 85% of the fair market value of the Common Stock on the date of the grant of the option, as defined, or (b) 85% of the fair market value of the Common Stock on the date of exercise of the option, as defined.

##### Third Amended and Restated 1995 Stock Plan

The Third Amended and Restated 1995 Stock Plan (the "Stock Plan") was adopted by the Board of Directors on March 5, 1998 and approved by the Company's stockholders on May 27, 1998. The Stock Plan currently provides for the issuance of a maximum of 3,500,000 shares of the Company's Common Stock pursuant to the grant to employees of incentive stock options and the grant of non-qualified stock options, stock awards or opportunities to make direct purchases of the Company's Common Stock to employees, consultants, directors and executive officers of the Company. The terms of the options granted will be subject to the

F-14

#### TRANSWITCH CORPORATION AND SUBSIDIARIES

##### NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)

(in thousands, except share and per share amounts)

provisions of the Stock Plan as determined by the Compensation Committee of the Board of Directors. The Stock Plan will terminate ten years after its adoption unless earlier terminated by the Board of Directors.

As of December 31, 1998 and 1997, 324,400 and 685,526 shares, respectively, were available for grant under the Stock Plan.

##### 1995 Non-Employee Director Stock Option Plan

The 1995 Non-Employee Director Stock Option Plan (the "Director Plan") was adopted by the Board of Directors on April 11, 1995 and approved by the Company's stockholders on April 19, 1995. The Director Plan provides for the automatic grant of options to purchase shares of Common Stock, up to an aggregate of 250,000 shares, to non-employee directors of the Company on the

anniversary date of each individual board member joining the Board of Directors. Upon joining the Company's Board, Directors are granted an option to purchase 12,500 shares, one-third of which vest immediately, one-third after the first year and the remaining one-third after the second year. Annually thereafter, Directors are granted an option to purchase 9,600 shares, which vest fully after one year.

The Director Plan is administered by the Compensation Committee of the Board of Directors. No option granted under the Director Plan may be exercised after the expiration of five years from the date of grant. The exercise price of options under the Director Plan must be equal to the fair market value of the Common Stock on the date of grant. Options granted under the Director Plan are generally nontransferable.

Stock Option Information

Information regarding the Company's stock options is set forth as follows:

<TABLE>  
<CAPTION>

	Number of Options	Weighted Average Option Price
	-----	-----
<S>	<C>	<C>
Outstanding at December 31, 1995	1,304,681	\$ 3.86
Granted.....	1,585,054	7.63
Exercised.....	(309,454)	0.58
Canceled.....	(778,968)	10.17
	-----	-----
Outstanding at December 31, 1996	1,801,313	4.81
Granted.....	1,338,800	7.26
Exercised.....	(380,180)	1.48
Canceled.....	(589,617)	8.38
	-----	-----
Outstanding at December 31, 1997	2,170,316	5.72
Granted.....	1,611,263	13.98
Exercised.....	(758,864)	4.88
Canceled.....	(153,953)	7.86
	-----	-----
Outstanding at December 31, 1998.....	2,868,762	\$11.91
	=====	=====

</TABLE>

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

Options outstanding and exercisable at December 31, 1998 are as follows:

<TABLE>  
<CAPTION>

Options Outstanding Options Exercisable

Range of Exercise Prices	Number Outstanding	Weighted Average Contractual Life	Weighted Average Exercise Price	Number Exercisable	Weighted Average Exercise Price
<S> \$ 0.40 to \$ 1.20 4.13 to 6.38 6.50 to 10.81 10.88 to 12.63 12.94 to 14.63 15.63 to 17.63 19.00 to 33.06 \$ 0.40 to \$33.06 =====	<C>  86,817  745,581  746,918  330,883  737,863  34,500  186,200  2,868,762 =====	<C>  0.15  7.31  8.71  8.47  9.71  8.69  9.34  7.48 =====	<C>  \$ 0.83  5.29  9.29  11.55  14.56  16.24  25.63  \$11.91 =====	<C>  85,335  404,653  172,234  61,583  --  16,500  18,267  758,572 =====	<C>  \$ 0.82  5.49  8.87  11.34  --  16.22  28.29  \$10.15 =====

Stock options expire five or ten years from the date of grant and are generally exercisable ratably over four years from the date of grant.

In connection with stock options granted in January 1995 through March 31, 1995, the Company recorded deferred compensation expense of \$618 for the excess of the deemed value for accounting purposes of the Common Stock issuable upon exercise of such stock options over the aggregate exercise price of such options. The Company is recording compensation expense over the applicable vesting periods (primarily four years). For the years ended December 31, 1998, 1997 and 1996, the Company recorded compensation expense of \$155, \$155 and \$156, respectively, for these options.

The Company does not recognize compensation expense relating to employee stock options because the exercise price of the option equals the fair value of the stock on the date of grant. If the Company had determined the compensation based on the fair value of the options on the date of grant in accordance with SFAS No. 123, the pro forma net income (loss) and earnings (loss) per share would be as follows:

<TABLE>  
<CAPTION>

Years Ended December 31,		
1998	1997	1996
-----	-----	-----

<S>	<C>	<C>	<C>
Net income (loss)--as reported.....	\$6,003	\$(1,873)	\$(10,077)
Net income (loss)--pro forma.....	590	(4,317)	(11,590)
Basic earnings (loss) per share--as reported.....	0.43	(0.15)	(0.86)
Basic earnings (loss) per share--pro forma.....	0.04	(0.36)	(0.99)
Diluted earnings (loss) per share--as reported....	0.40	(0.15)	(0.86)
Diluted earnings (loss) per share--pro forma.....	0.04	(0.36)	(0.99)

</TABLE>

The effects of applying SFAS No. 123 in this pro forma disclosure are not necessarily indicative of future amounts because it does not take into consideration pro forma compensation expense related to grants made prior to 1995.

F-16

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

As reflected in the pro forma amounts in the preceding table, the average fair value of each option granted in 1998, 1997 and 1996 was \$7.64, \$3.76 and \$3.68, respectively. The fair value of each option granted was estimated on the date of grant using the modified Black-Scholes option pricing model based on the following weighted average assumptions:

<TABLE>

<CAPTION>

	1998	1997	1996
	----	----	----
<S>	<C>	<C>	<C>
Risk-free interest rate.....	5.2%	5.7%	6.0%
Expected life in years.....	8.1	7.7	7.9
Expected volatility.....	68.9%	66.0%	52.0%
Expected dividend yield.....	--	--	--

</TABLE>

For the years ended December 31, 1998, 1997 and 1996, the Company recognized additional compensation expense of \$229, \$225 and \$195, respectively, as required by SFAS No. 123, relating to stock options granted to non-employees.

Warrants

Warrants to purchase Common Stock and Preferred Stock were granted to the original investors in consideration of additional financing and loans and for services performed by various other parties. The warrants presented in the table below are convertible into Common Stock and Preferred Stock at a rate of one share of Common Stock and Preferred Stock for each warrant to purchase Common Stock and Preferred Stock, respectively.

<TABLE>

<CAPTION>

Warrants--Common Stock			
-----			
Number	Price	Per	Expiration
of	Share	Share	Date
Warrants			

<S>	<C>	<C>	<C>
Outstanding at December 31, 1995.....	92,445	\$ .06-1.00	12/96-11/98
Exercised .....	(82,011)	--	12/96-11/98
Outstanding at December 31, 1996.....	10,434	\$ .40-1.00	12/96-11/98
Exercised.....	(8,038)	--	12/96-11/98
Outstanding at December 31, 1997 .....	2,396	\$ .40-1.00	12/96-11/98
Expired.....	(2,396)	--	--
Outstanding at December 31, 1998.....	--	\$ --	--

</TABLE>

(9) Earnings Per Share

The basic earnings (loss) per share for the years ended December 31, 1998, 1997 and 1996 follows:

<TABLE>  
<CAPTION>

	Years Ended December 31,		
	1998	1997	1996
<S>	<C>	<C>	<C>
Net income (loss).....	\$ 6,003	\$ (1,873)	\$ (10,077)
Average shares (in thousands).....	13,926	12,152	11,751
Basic earnings (loss) per share.....	\$ 0.43	\$ (0.15)	\$ (0.86)

</TABLE>

Diluted loss per share amounts are not presented for the years ended December 31, 1997 and 1996 as they are the same as basic. Because the Company recorded a net loss in each of these years, the assumed exercise of dilutive securities would be antidilutive.

F-17

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
(in thousands, except share and per share amounts)

Diluted earnings per share for the year ended December 31, 1998 follows:

<TABLE>  
<CAPTION>

Net income	\$ 6,003
<S>	<C>
Average common shares outstanding for the period (in thousands).....	13,926
Stock options, net of assumed treasury share repurchases (in thousands).....	957
Adjusted average shares outstanding for the period	

(in thousands).....	14,883
	=====
Diluted earnings per share.....	\$ 0.40
	=====

</TABLE>

The weighted average shares of dilutive securities that would have been used to calculate diluted EPS had their effect not been anti-dilutive for the years ended December 31, 1997 and 1996 are as follows:

<TABLE>

<CAPTION>

	Years Ended December 31,	
	1997	1996
	-----	-----
<S>	<C>	<C>
Stock options.....	634,867	281,460
Warrants.....	1,954	5,153
Convertible preferred stock.....	380,697	--
	-----	-----
Total.....	1,017,518	286,613
	=====	=====

</TABLE>

#### (10) Employee Savings Plan

On November 21, 1988, the Company established a 401(k) retirement savings plan (the "Plan"). All employees are entitled to contribute from 1% to 15% of their pre-tax income to the Plan, not to exceed the IRS maximum for income deferrals. Each participant may elect to invest their contributions in various established funds, which include money market, fixed income and equity funds. In 1998, the maximum contribution was 20% of pre-tax income subject to IRS limitations. In 1996, the Company began providing matching contributions for 50 percent of the employees' deferred compensation, up to a maximum of 6 percent. The Company's contribution expense amounted to \$230, \$188 and \$156 for 1998, 1997 and 1996, respectively.

#### (11) Commitments and Contingencies

##### Line of Credit

In July 1998, the Company entered into a new line of credit agreement with Silicon Valley Bank whereby the Company has access up to \$8,000 for working capital purposes, bearing interest at prime +3/4% due on July 8, 1999, and \$2,000 for equipment purchases, bearing interest at prime +1% due on May 31, 2002. The lines are secured by all corporate assets except intellectual property of the Company.

The agreement contains certain financial restrictions and covenants which, among other things, include provisions for maintaining a minimum amount of cash, net worth and profitability.

At December 31, 1998 and 1997, no amounts were outstanding under this agreement.

TRANSWITCH CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS--(Continued)  
 (in thousands, except share and per share amounts)

Development Agreements

From time to time, the Company has entered into agreements with third parties for the development and/or licensing of products for its manufacture and sale, or the licensing of technology that the Company may use in the manufacture of products, for which royalties are paid based upon actual sales of these products. The Company recognized royalty expense of \$673, \$829, and \$1,266 in 1998, 1997 and 1996, respectively, under these agreements; these amounts are included in cost of products sold in the consolidated statements of operations.

Lease Agreements

Total rental expense under all operating lease agreements aggregated \$797, \$745 and \$446 during 1998, 1997 and 1996, respectively. Future minimum operating lease commitments that have remaining, non-cancelable lease terms in excess of one year at December 31, 1998 follow:

<TABLE>

<S>	<C>
1999.....	\$ 658
2000.....	579
2001.....	434
2002.....	393
2003.....	393
Thereafter.....	1,473
	-----
	\$3,930
	=====

</TABLE>

Foundry Purchase Commitments

In April, 1996, the Company entered into a foundry agreement with Taiwan Semiconductor Manufacturing Co., Ltd. (TSMC) which includes a future minimum purchase commitment of \$128 for 1999.

(12) Subsequent Events

On February 12, 1999, the Company completed a follow-on public offering for 1,700,000 shares of its Common Stock, as described in detail in the Company's prospectus dated February 9, 1999. As a result of the offering, the Company raised proceeds of approximately \$59,100, net of underwriter's commissions and related direct offering costs.



VALUATION AND QUALIFYING ACCOUNTS  
(in thousands)

<TABLE>  
<CAPTION>

Description	Additions				Balance
-----	Balance at	Charged to	Charges	Deductions	at End
-----	Beginning	Costs and	to Other	-----	of
-----	of Period	Expenses	Accounts	-----	Period
-----	-----	-----	-----	-----	-----
Year ended December 31, 1998:					
<S>	<C>	<C>	<C>	<C>	<C>
Allowance for losses on:					
Accounts receivable.....	\$ 218	\$ 50	\$--	\$ (7)	\$ 261
Inventory.....	1,278	503	--	(238)	1,543
Deferred tax valuation					
allowance.....	14,867	--	--	(42)	14,825
	-----	-----	-----	-----	-----
	\$ 16,363	\$ 553	\$--	\$ (287)	\$16,629
	=====	=====	=====	=====	=====

<CAPTION>

Year ended December 31, 1997:					
<S>	<C>	<C>	<C>	<C>	<C>
Allowance for losses on:					
Accounts receivable.....	\$ 140	\$ 100	\$--	\$ (22)	\$ 218
Inventory.....	1,196	121	--	(39)	1,278
Deferred tax valuation					
allowance.....	13,384	1,483	--	--	14,867
	-----	-----	-----	-----	-----
	\$ 14,720	\$1,704	\$--	\$ (61)	\$16,363
	=====	=====	=====	=====	=====

<CAPTION>

Year ended December 31, 1996:					
<S>	<C>	<C>	<C>	<C>	<C>
Allowance for losses on:					
Accounts receivable.....	\$ 138	\$ 14	\$--	\$ (12)	\$ 140
Inventory.....	295	1,261	--	(360)	1,196
Deferred tax valuation					
allowance.....	8,426	4,958	--	--	13,384
	-----	-----	-----	-----	-----
	\$ 8,859	\$6,233	\$--	\$ (372)	\$14,720
	=====	=====	=====	=====	=====

</TABLE>

[AMENDED AND RESTATED PROMISSORY NOTE]  
(Working Capital Line of Credit Loans)

\$8,000,000

Shelton, Connecticut  
July 16, 1998 (originally  
dated July 1, 1993, as  
previously amended)

For value received, the undersigned TRANSWITCH CORPORATION, a Delaware corporation (the "Borrower"), promises to pay to SILICON VALLEY BANK (the "Bank") at the office of the Bank located at 3003 Tasman Drive, Santa Clara, California 95054, or to its order, the lesser of (i) Eight Million Dollars (\$8,000,000.) or (ii) the principal outstanding hereunder on July 15, 1999 (the "Maturity Date"), together with interest on the principal amount hereof from time to time outstanding at a fluctuating rate per annum equal to the Prime Rate (as defined below) until the Maturity Date, payable monthly in arrears on the fifteenth (15th) day of each calendar month occurring after the date hereof and on the Maturity Date. The Borrower promises to pay on demand interest at a per annum rate of interest equal to the Prime Rate plus five percent (5%) on any overdue principal (and to the extent permitted by law, overdue interest). The Bank's "Prime Rate" is the per annum rate of interest from time to time announced and made effective by the Bank as its Prime Rate (which rate may or may not be the lowest rate available from the Bank at any given time).

Computations of interest shall be made by the Bank on the basis of a year of 360 days for the actual number of days occurring in the period for which such interest is payable.

This promissory note amends and restates the terms and conditions of the obligations of the Borrower under the Working Capital Note dated July 1, 1993 (the "Original Note"), by the Borrower to the Bank, as amended from time to

-----  
time. Nothing contained in this promissory note shall be deemed to create or represent the issuance of new indebtedness or the exchange by the Borrower of the Original Note for a new promissory note. This promissory note is the Working Capital Note referred to in the Sixth Loan Modification Agreement of even date herewith, which amends the Commitment Letter dated as of July 1, 1993, between the Bank and the Borrower, as amended by letter amendments dated as of September 1, 1994 and March 21, 1995, and as further amended by loan modification agreements dated as of April 8, 1994, April 19, 1995, January 5, 1996, December 31, 1996 and July 11, 1997, together with all related schedules, as the same may be further amended, modified or supplemented from time to time (the "Commitment Letter"), and is entitled to the benefits of the Commitment

-----  
Letter and of the other Loan Documents referred to therein, and is subject to optional and mandatory prepayment as provided therein.

Upon the occurrence of any Event of Default under, and as defined in, the Commitment Letter, the principal amount then outstanding of, and the accrued interest on, the advances under this promissory note, and all other amounts payable under this promissory note shall, at the option of the Bank, become immediately due and payable, without notice (including, without

-2-

limitation, notice of intent to accelerate), presentment, demand, protest or other formalities of any kind, all of which are hereby expressly waived by the Borrower.

The Bank shall keep a record of the amount and the date of the making of each advance pursuant to the Commitment Letter and each payment of principal with respect thereto by maintaining a computerized record of such information and printouts of such computerized record, which endorsement or computerized record, and the printouts thereof, shall constitute prima facie evidence of the accuracy of the information so endorsed.

The undersigned agrees to pay all reasonable costs and expenses of the Bank (including, without limitation, the reasonable fees and expenses of attorneys) in connection with the enforcement of this promissory note and the other Loan Documents and the preservation of their respective rights hereunder and thereunder.

No delay or omission on the part of the Bank in exercising any right hereunder shall operate as a waiver of such right or of any other right of the Bank, nor shall any delay, omission or waiver on any one occasion be deemed a bar to or waiver of the same or any other right on any future occasion. The Borrower and every endorser or guarantor of this promissory note regardless of the time, order or place of signing waives presentment, demand, protest and notices of every kind and assents to any one or more extensions or postponements of the time of payment or any other indulgences, to any substitutions, exchanges or releases of collateral for this promissory note, and to the additions or releases of any other parties or persons primarily or secondarily liable.

THIS PROMISSORY NOTE SHALL BE DEEMED DELIVERED TO THE BANK AND ACCEPTED BY THE BANK IN THE STATE OF CALIFORNIA.

THE BORROWER HEREBY EXPRESSLY WAIVES ANY RIGHT IT MAY NOW OR HEREAFTER HAVE TO A JURY TRIAL IN ANY SUIT, ACTION OR PROCEEDING WHICH ARISES OUT OF OR BY REASON OF THIS PROMISSORY NOTE, ANY LOAN DOCUMENT (AS DEFINED IN THE COMMITMENT LETTER), OR THE TRANSACTIONS CONTEMPLATED HEREBY.

BY ITS EXECUTION AND DELIVERY OF THIS PROMISSORY NOTE, THE BORROWER ACCEPTS FOR ITSELF AND IN CONNECTION WITH ITS PROPERTIES, GENERALLY AND UNCONDITIONALLY, THE NONEXCLUSIVE JURISDICTION OF ANY STATE OR FEDERAL COURT OF COMPETENT JURISDICTION IN THE COMMONWEALTH OF MASSACHUSETTS (OR IF FOR ANY REASON ACCESS

TO SUCH COURTS IS DENIED TO THE BANK, THEN IN THE STATE OF CALIFORNIA) IN ANY ACTION, SUIT OR PROCEEDING OF ANY KIND AGAINST IT WHICH ARISES OUT OF OR BY REASON OF THIS PROMISSORY NOTE, ANY LOAN DOCUMENT (AS DEFINED IN THE CREDIT AGREEMENT), OR THE TRANSACTIONS CONTEMPLATED HEREBY, IN ADDITION TO ANY OTHER COURT IN WHICH SUCH ACTION, SUIT OR PROCEEDING MAY BE BROUGHT, IRREVOCABLY AGREES TO BE BOUND BY ANY FINAL JUDGMENT RENDERED BY ANY SUCH COURT IN ANY SUCH ACTION, SUIT OR PROCEEDING IN WHICH IT SHALL HAVE BEEN SERVED WITH PROCESS IN THE

-3-

MANNER HEREINAFTER PROVIDED, SUBJECT TO EXERCISE AND EXHAUSTION OF ALL RIGHTS OF APPEAL AND TO THE EXTENT THAT IT MAY LAWFULLY DO SO, WAIVES AND AGREES NOT TO ASSERT, BY WAY OF MOTION, AS A DEFENSE OR OTHERWISE, IN SUCH ACTION, SUIT OR PROCEEDING ANY CLAIMS THAT IT IS NOT PERSONALLY SUBJECT TO THE JURISDICTION OF SUCH COURT, THAT ITS PROPERTY IS EXEMPT OR IMMUNE FROM ATTACHMENT OR EXECUTION, THAT THE ACTION, SUIT OR PROCEEDING IS BROUGHT IN AN INCONVENIENT FORUM OR THAT THE VENUE THEREOF IS IMPROPER, AND AGREES THAT PROCESS MAY BE SERVED UPON IT IN ANY SUCH ACTION, SUIT OR PROCEEDING IN THE MANNER PROVIDED BY CHAPTER 223A OF THE GENERAL LAWS OF MASSACHUSETTS, RULE 4 OF THE MASSACHUSETTS RULES OF CIVIL PROCEDURE OR RULE 4 OF THE FEDERAL RULES OF CIVIL PROCEDURE.

ALL RIGHTS AND OBLIGATIONS HEREUNDER SHALL BE GOVERNED BY THE LAWS OF THE COMMONWEALTH OF MASSACHUSETTS AND THIS PROMISSORY NOTE SHALL BE DEEMED TO BE UNDER SEAL.

TRANSWITCH CORPORATION

By: /s/ Michael F. Stauff

-----  
Michael F. Stauff, SVP & Treasurer

[AMENDED AND RESTATED PROMISSORY NOTE]  
(Equipment Line of Credit Loans)

\$2,000,000

Shelton, Connecticut  
July 16, 1998 (originally  
dated December 31, 1996)

For value received, the undersigned TRANSWITCH CORPORATION, a Delaware corporation (the "Borrower"), promises to pay to SILICON VALLEY BANK (the "Bank") at the office of the Bank located at 3003 Tasman Drive, Santa Clara, California 95054, or to its order, the lesser of (i) Two Million Dollars (\$2,000,000.) or (ii) the principal outstanding hereunder as of July 15, 1999, in forty-eight (48) equal monthly installments payable on the fifteenth day of each month, commencing August 15, 1999 and ending on July 15, 2003 (the "Maturity Date"), together with interest on the principal amount hereof from time to time outstanding at a fluctuating rate per annum equal to the Prime Rate (as defined below) until the Maturity Date, payable monthly in arrears on the fifteenth (15th) day of each calendar month occurring after the date hereof and on the Maturity Date. The Borrower promises to pay on demand interest at a per annum rate of interest equal to the Prime Rate plus five percent (5%) on any overdue principal (and to the extent permitted by law, overdue interest). The Bank's "Prime Rate" is the per annum rate of interest from time to time announced and made effective by the Bank as its Prime Rate (which rate may or may not be the lowest rate available from the Bank at any given time).

Computations of interest shall be made by the Bank on the basis of a year of 360 days for the actual number of days occurring in the period for which such interest is payable.

This promissory note amends and restates the terms and conditions of the obligations of the Borrower under the Promissory Note (Equipment Line of Credit Loans) dated December 31, 1996 (the "Original Note"), by the Borrower to the Bank, as amended from time to time. Nothing contained in this promissory note shall be deemed to create or represent the issuance of new indebtedness or the exchange by the Borrower of the Original Note for a new promissory note. This promissory note is the Equipment Note referred to in the Sixth Loan Modification Agreement of even date herewith, which amends the Commitment Letter dated as of July 1, 1993, between the Bank and the Borrower, as amended by letter amendments dated as of September 1, 1994 and March 21, 1995, and as further amended by loan modification agreements dated as of April 8, 1994, April 19, 1995, January 5, 1996, December 31, 1996 and July 11, 1997, together with all related schedules, as the same may be further amended, modified or supplemented from time to time (the "Commitment Letter"), and is entitled to the benefits of the Commitment Letter and of the other Loan Documents referred to

therein, and is subject to optional and mandatory prepayment as provided therein.

Upon the occurrence of any Event of Default under, and as defined in, the Commitment Letter, the principal amount then outstanding of, and the accrued interest on, the advances under this promissory note, and all other amounts payable under this promissory note shall, at the option of the Bank become immediately due and payable, without notice (including, without

-2-

limitation, notice of intent to accelerate), presentment, demand, protest or other formalities of any kind, all of which are hereby expressly waived by the Borrower.

The Bank shall keep a record of the amount and the date of the making of each advance pursuant to the Commitment Letter and each payment of principal with respect thereto by maintaining a computerized record of such information and printouts of such computerized record, which endorsement or computerized record, and the printouts thereof, shall constitute prima facie evidence of the accuracy of the information so endorsed.

The undersigned agrees to pay all reasonable costs and expenses of the Bank (including, without limitation, the reasonable fees and expenses of attorneys) in connection with the enforcement of this promissory note and the other Loan Documents and the preservation of their respective rights hereunder and thereunder.

No delay or omission on the part of the Bank in exercising any right hereunder shall operate as a waiver of such right or of any other right of the Bank, nor shall any delay, omission or waiver on any one occasion be deemed a bar to or waiver of the same or any other right on any future occasion. The Borrower and every endorser or guarantor of this promissory note regardless of the time, order or place of signing waives presentment, demand, protest and notices of every kind and assents to any one or more extensions or postponements of the time of payment or any other indulgences, to any substitutions, exchanges or releases of collateral for this promissory note, and to the additions or releases of any other parties or persons primarily or secondarily liable.

THIS PROMISSORY NOTE SHALL BE DEEMED DELIVERED TO THE BANK AND ACCEPTED BY THE BANK IN THE STATE OF CALIFORNIA.

THE BORROWER HEREBY EXPRESSLY WAIVES ANY RIGHT IT MAY NOW OR HEREAFTER HAVE TO A JURY TRIAL IN ANY SUIT, ACTION OR PROCEEDING WHICH ARISES OUT OF OR BY REASON OF THIS PROMISSORY NOTE, ANY LOAN DOCUMENT (AS DEFINED IN THE COMMITMENT LETTER), OR THE TRANSACTIONS CONTEMPLATED HEREBY.

BY ITS EXECUTION AND DELIVERY OF THIS PROMISSORY NOTE, THE BORROWER

ACCEPTS FOR ITSELF AND IN CONNECTION WITH ITS PROPERTIES, GENERALLY AND UNCONDITIONALLY, THE NON-EXCLUSIVE JURISDICTION OF ANY STATE OR FEDERAL COURT OF COMPETENT JURISDICTION IN THE COMMONWEALTH OF MASSACHUSETTS (OR IF FOR ANY REASON ACCESS TO SUCH COURTS IS DENIED TO THE BANK, THEN IN THE STATE OF CALIFORNIA) IN ANY ACTION, SUIT OR PROCEEDING OF ANY KIND AGAINST IT WHICH ARISES OUT OF OR BY REASON OF THIS PROMISSORY NOTE, ANY LOAN DOCUMENT (AS DEFINED IN THE CREDIT AGREEMENT), OR THE TRANSACTIONS CONTEMPLATED HEREBY, IN ADDITION TO ANY OTHER COURT IN WHICH SUCH ACTION, SUIT

-3-

OR PROCEEDING MAY BE BROUGHT, IRREVOCABLY AGREES TO BE BOUND BY ANY FINAL JUDGMENT RENDERED BY ANY SUCH COURT IN ANY SUCH ACTION, SUIT OR PROCEEDING IN WHICH IT SHALL HAVE BEEN SERVED WITH PROCESS IN THE MANNER HEREINAFTER PROVIDED, SUBJECT TO EXERCISE AND EXHAUSTION OF ALL RIGHTS OF APPEAL AND TO THE EXTENT THAT IT MAY LAWFULLY DO SO, WAIVES AND AGREES NOT TO ASSERT, BY WAY OF MOTION, AS A DEFENSE OR OTHERWISE, IN SUCH ACTION, SUIT OR PROCEEDING ANY CLAIMS THAT IT IS NOT PERSONALLY SUBJECT TO THE JURISDICTION OF SUCH COURT, THAT ITS PROPERTY IS EXEMPT OR IMMUNE FROM ATTACHMENT OR EXECUTION, THAT THE ACTION, SUIT OR PROCEEDING IS BROUGHT IN AN INCONVENIENT FORUM OR THAT THE VENUE THEREOF IS IMPROPER, AND AGREES THAT PROCESS MAY BE SERVED UPON IT IN ANY SUCH ACTION, SUIT OR PROCEEDING IN THE MANNER PROVIDED BY CHAPTER 223A OF THE GENERAL LAWS OF MASSACHUSETTS, RULE 4 OF THE MASSACHUSETTS RULES OF CIVIL PROCEDURE OR RULE 4 OF THE FEDERAL RULES OF CIVIL PROCEDURE.

ALL RIGHTS AND OBLIGATIONS HEREUNDER SHALL BE GOVERNED BY THE LAWS OF THE COMMONWEALTH OF MASSACHUSETTS AND THIS PROMISSORY NOTE SHALL BE DEEMED TO BE UNDER SEAL.

TRANSWITCH CORPORATION

By: /s/ Michael F. Stauff

-----  
Michael F. Stauff, SVP & Treasurer

SIXTH LOAN MODIFICATION AGREEMENT

This SIXTH LOAN MODIFICATION AGREEMENT is entered into as of July 16, 1998, by and between SILICON VALLEY BANK, a California-chartered bank with its principal place of business at 3003 Tasman Drive, Santa Clara, CA 95054 and with a loan production office located at Wellesley Office Park, 40 William Street, Suite 350, Wellesley, MA 02181, doing business under the name Silicon Valley East ("Bank"), and TRANSWITCH CORPORATION, a Delaware corporation with its principal place of business at 3 Enterprise Drive, Shelton, Connecticut 06484 ("Borrower").

RECITALS

Borrower has borrowed money from Bank pursuant to certain Existing Loan Documents, as defined below. In consideration of certain financial accommodations from Bank, and Borrower's continuing obligations under the Existing Loan Documents, Borrower and Bank agree as follows:

AGREEMENT

1. DESCRIPTION OF EXISTING LOAN DOCUMENTS. Reference is hereby made to -----

that certain Commitment Letter dated as of July 1, 1993 between Bank and Borrower, as amended by letter amendments dated as of September 1, 1994 and March 21, 1995, as further amended by Loan Modification Agreements dated April 8, 1994, April 19, 1995, January 5, 1996, December 31, 1996 and July 11, 1997 between Borrower and Bank, and as such Commitment Letter may be further amended from time to time (the "Commitment Letter"), providing for certain financing from Bank to Borrower, such financing to be evidenced by promissory notes as referenced herein. Hereinafter, all indebtedness owing by Borrower to Bank pursuant to the Commitment Letter and any promissory notes shall be referred to as the "Indebtedness." Repayment of the Indebtedness is secured pursuant to a Security Agreement dated as of July 1, 1993 between Borrower and Bank, as amended (the "Security Agreement"). Hereinafter, the Commitment Letter, Security Agreement, and any promissory notes, together with all other documents securing payment of the Indebtedness, shall be referred to as the "Existing Loan Documents." Unless otherwise defined herein, capitalized terms used in this Agreement shall have the same respective meanings as set forth in the Commitment Letter.

2. DESCRIPTION OF CHANGES IN TERMS. -----

2.1 Modifications to Commitment Letter. -----



2.1.1 The first sentence of the first unnumbered paragraph of the Commitment Letter, as heretofore amended, is hereby replaced in its entirety as follows:

Silicon Valley Bank (the "Bank") is pleased to inform you that it has approved for TranSwitch Corporation (the "Borrower"), subject to the terms set forth in this letter and the attached schedules (collectively

referred to as the "Commitment Letter"), the following credit facilities: (i) a working capital line of credit of \$8,000,000 (the "Working Capital Commitment"); and (ii) an equipment line of credit of \$2,000,000 (the "Equipment Commitment" and, together with the Working Capital Commitment, the "Commitments").

2.1.2 Subparagraphs (a) and (b) of numbered paragraph 1 of the Commitment Letter, as heretofore amended, are hereby replaced in their entirety as follows:

(a) a promissory note payable to the order of the Bank by the Borrower in the principal amount of \$8,000,000 with respect to the Working Capital Commitment (as the same may be amended, modified or supplemented from time to time, the "Working Capital Note"),

(b) a promissory note payable to the order of the Bank by the Borrower in the principal amount of \$2,000,000 with respect to the Equipment Commitment (as the same may be amended, modified or supplemented from time to time, the "Equipment Note" and together with the Working Capital Note, the "Notes");

2.1.3 Subsections (d) and (e) of numbered paragraph 1 of the Commitment Letter, as heretofore amended, are hereby replaced in their entirety as follows:

(d) a Negative Pledge Agreement by the Borrower in favor of the Bank (as the same may be amended, modified or supplemented from time to time, the "Negative Pledge Agreement");

(e) INTENTIONALLY OMITTED;

2.1.4 Numbered paragraph 2 of the Commitment Letter, as heretofore amended, is hereby replaced in its entirety as follows:

2. The Working Capital Commitment will commence July 16, 1998 and will expire on July 15, 1999 (the "Working Capital Expiry Date"). The Equipment Commitment will commence July 16, 1998 and will expire on July 15, 1999 (the "Equipment Expiry Date").

2.1.5 The first two sentences of numbered paragraph 3 of the Commitment Letter, as heretofore amended, are hereby replaced in their entirety as follows:

Advances under the Working Capital Commitment shall bear interest at a fluctuating rate of interest equal to the Bank's Prime Rate (as defined below) per annum, and advances under the Equipment Line of Credit Commitment shall bear interest at a fluctuating rate of interest equal to the Bank's Prime Rate per annum. Borrower shall make payments of interest in respect of advances under the Working Capital Commitment monthly

-2-

on the fifteenth (15th ) day of each month and on the Working Capital Expiry Date. Borrower shall make payments of interest in respect of advances under the Equipment Commitment monthly on the fifteenth (15th) day of each month and on the Equipment Expiry Date.

2.1.6 Paragraph 7C of the Commitment Letter, as heretofore amended, is hereby replaced in its entirety as follows:

Proceeds of all advances under the Equipment Commitment shall be used by the Borrower solely to finance the purchase by the Borrower of Eligible Equipment purchased within 30 days of Borrower's request for an advance under the Equipment Commitment. The principal amount of any advance made by the Equipment Commitment shall not exceed 100% of the invoice price of any item of Eligible Equipment less taxes, shipping, installation and similar or related costs. The Borrower shall provide the Bank with copies of all invoices for items of Eligible Equipment not later than the date of its request for such an advance and shall promptly provide such other information as the Bank shall reasonably request in support of Borrower's request.

2.1.7 Numbered paragraph 8 of the Commitment Letter, as heretofore amended, is hereby amended so that Borrower may use all of the Working Capital Commitment for Letters of Credit.

2.1.8 Numbered paragraph 4 of Schedule II to the Commitment Letter, as heretofore amended, is hereby replaced in its entirety as follows:

4. Financial Statements, Etc. Borrower will furnish to Bank:

(a) as soon as available, but in any event within forty five (45) days after the end of each fiscal quarter, commencing with the quarter ending June 30, 1998, consolidated financial statements of Borrower on Form 10-Q;

(b) as soon as available, but in any event within one hundred twenty (120) days after the end of Borrower's fiscal year, audited consolidated financial statements of Borrower on Form 10-K;

(c) within five (5) days of filing, copies of all statements,

reports and notices sent or made available generally by Borrower to its security holders or to any holders of Subordinated Debt and all reports on Form 10-K, 10-Q and 8-K (to the extent not previously provided to Bank) filed with the Securities and Exchange Commission;

-3-

(d) promptly upon receipt of notice thereof, a report of any legal actions pending or threatened against Borrower or any Subsidiary that could result in a Material Adverse Effect;

(f) such budgets, sales projections, operating plans or other financial information as Bank may reasonably request from time to time.

(g) prior to any Advances under the Working Capital Commitment, and within thirty (30) days after the last day of each month in which any Advances under the Working Capital Commitment are outstanding, a Borrowing Base Certificate signed by the Chief Financial Officer or the President of Borrower in a form acceptable to Bank and appropriately completed, together with aged listings of accounts receivable.

(h) within thirty (30) days after the last day of each quarter, commencing with the quarter ending June 30, 1998, a Compliance Certificate signed by the Chief Financial Officer or the President of Borrower in a form acceptable to Bank and appropriately completed.

2.1.9 Numbered paragraphs 21 through 25 of Schedule II to the Commitment Letter, as heretofore amended, are hereby replaced in their entirety as follows:

21. Adjusted Quick Ratio. The Borrower will not permit its

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Adjusted Quick Ratio to be less than 2.00 to 1 at the end of any calendar quarter, commencing with the quarter ending June 30, 1998.

22. Minimum Profitability. INTENTIONALLY OMITTED

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23. Leverage. The Borrower will not permit the ratio of Total

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Adjusted Liabilities to Tangible Net Worth at the end of any calendar quarter, commencing with the quarter ending June 30, 1998, to be more than 1.25 to 1.

24. Tangible Net Worth. The Borrower will not permit Tangible Net

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Worth at the end of any calendar quarter, commencing with the quarter ending June 30, 1998, to be less than \$28,000,000.

25. Liquidity. INTENTIONALLY OMITTED

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2.1.10 The Compliance Certificate referred to in numbered subparagraph 4(c) of Schedule II to the Commitment Letter, as heretofore amended, is hereby deleted and replaced with the Compliance Certificate attached hereto as Exhibit A.

2.1.11 Subsection (i) of the definition of "Eligible Domestic Accounts Receivable" on Schedule III to the Commitment Letter, as heretofore amended, is hereby replaced in its entirety as follows:

-4-

(i) The aggregate accounts receivables from the account debtor do not exceed 25% of the total Eligible Accounts Receivable of the Borrower; that portion of the account over the 25% level will be disqualified.

2.1.12 The definition of "Eligible Equipment" in Schedule III of the Commitment Letter, as heretofore amended, is hereby amended by deleting the date July 11, 1997 appearing in the last line of subparagraph (b) thereof and substituting the date July 16, 1998.

2.1.13 The following definition is hereby added to Schedule III to the Commitment Letter, as heretofore amended, as follows:

"Adjusted Quick Ratio" means, at any time, all cash and accounts receivable, less reserves for doubtful accounts, of the Borrower and its Subsidiaries at such time, on a consolidated basis, determined in accordance with GAAP, divided by the aggregate of all Current Liabilities (less deferred revenues) plus, to the extent not already included, all Indebtedness of Borrower to Bank.

3. TERMINATION OF SECURITY AGREEMENT. The Security Agreement is

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hereby terminated effective with Borrower's compliance with all of the conditions set forth in Section 5 of this Sixth Loan Modification Agreement, and all rights to the Collateral shall revert to Borrower, subject to the Negative Pledge Agreement between Borrower and Bank of even date herewith.

4. FACILITY FEE. Borrower shall pay to Bank a Working Capital

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Commitment facility fee of EIGHT THOUSAND AND NO/100THS Dollars (\$8,000) and an Equipment Commitment facility fee of TWO THOUSAND AND NO/100THS Dollars (\$2,000) as well as any out-of-pocket expenses incurred by the Bank through the date hereof, including reasonable attorneys' fees and expenses, and after the date hereof, all Bank Expenses, including reasonable attorneys' fees and expenses, as and when they become due.

5. CONDITIONS PRECEDENT TO FURTHER ADVANCES. The obligation of Bank

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to make further advances to Borrower under this line is subject to the condition precedent that Bank shall have received, in form and substance satisfactory to Bank, the following:

(a) this Sixth Loan Modification Agreement (in duplicate), the Working Capital Note and the Equipment Note, each duly executed by Borrower;

(b) a certificate of the Secretary of Borrower with respect to resolutions authorizing the execution and delivery of this Sixth Loan Modification Agreement and the Loan Documents;

(c) Negative Pledge Agreement covering all assets of Borrower;

(d) UCC-1 financing statements evidencing the negative pledge;

-5-

(e) insurance certificate;

(f) payment of the fees and Bank Expenses then due specified in Section 4 hereof; and

(g) such other documents, and completion of such other matters, as Bank may reasonably deem necessary or appropriate.

6. CONSISTENT CHANGES. The Existing Loan Documents are hereby amended

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wherever necessary to reflect the changes described in this Sixth Loan Modification Agreement.

7. NO DEFENSES OF BORROWER. Borrower agrees that as of this date, it

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has no defenses against any of the obligations to pay any amounts under the Indebtedness.

8. CONTINUING VALIDITY. Borrower understands and agrees that (i) in

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modifying the Existing Loan Documents, Bank is relying upon Borrower's representations, warranties and agreements, as set forth in the Existing Loan Documents, (ii) except as expressly modified pursuant to this Sixth Loan Modification Agreement (including the effects of Section 6 hereof), the Existing Loan Documents remain unchanged and in full force and effect, (iii) Bank's agreement to modify the Existing Loan Documents pursuant to this Sixth Loan Modification Agreement shall in no way obligate Bank to make any future modifications to the Existing Loan Documents, (iv) it is the intention of Bank and Borrower to retain as liable parties all makers and endorsers of the Existing Loan Documents, unless a party is expressly released by Bank in

writing, (v) no maker, endorser or guarantor will be released by virtue of this Sixth Loan Modification Agreement, and (vi) the terms of this Section 8 apply not only to this Sixth Loan Modification Agreement but also to all subsequent loan modification agreements, if any.

9. CHOICE OF LAW AND VENUE; JURY TRIAL WAIVER. The laws of the

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Commonwealth of Massachusetts shall apply to this Agreement. BORROWER ACCEPTS FOR ITSELF AND IN CONNECTION WITH ITS PROPERTIES, UNCONDITIONALLY, THE NON-EXCLUSIVE JURISDICTION OF ANY STATE OR FEDERAL COURT OF COMPETENT JURISDICTION IN THE COMMONWEALTH OF MASSACHUSETTS IN ANY ACTION, SUIT, OR PROCEEDING OF ANY KIND AGAINST IT WHICH ARISES OUT OF OR BY REASON OF THIS AGREEMENT; PROVIDED, HOWEVER, THAT IF FOR ANY REASON BANK CANNOT AVAIL ITSELF OF THE COURTS OF THE COMMONWEALTH OF MASSACHUSETTS, BORROWER ACCEPTS JURISDICTION OF THE COURTS AND VENUE IN SANTA CLARA COUNTY, CALIFORNIA. BORROWER AND BANK EACH HEREBY WAIVE THEIR RESPECTIVE RIGHTS TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION BASED UPON OR ARISING OUT OF ANY OF THE LOAN DOCUMENTS OR ANY OF THE TRANSACTIONS CONTEMPLATED THEREIN, INCLUDING CONTRACT CLAIMS, TORT CLAIMS, BREACH OF DUTY CLAIMS, AND ALL OTHER COMMON LAW OR STATUTORY CLAIMS. EACH PARTY RECOGNIZES AND AGREES THAT THE FOREGOING WAIVER CONSTITUTES A MATERIAL INDUCEMENT FOR IT TO ENTER INTO THIS AGREEMENT. EACH PARTY REPRESENTS AND WARRANTS THAT IT HAS REVIEWED THIS WAIVER WITH ITS

-6-

LEGAL COUNSEL AND THAT IT KNOWINGLY AND VOLUNTARILY WAIVES ITS JURY TRIAL RIGHTS FOLLOWING CONSULTATION WITH LEGAL COUNSEL.

10. EFFECTIVENESS. This Agreement shall become effective only when it

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shall have been executed by Borrower and Bank (provided, however, in no event shall this Agreement become effective until signed by an officer of Bank in California).

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as a sealed instrument as of the date first set forth above.

"Borrower"

"Bank"

TRANSWITCH CORPORATION

SILICON VALLEY BANK, doing business as  
SILICON VALLEY EAST

By: /s/ Michael F. Stauff

By:

-----  
Michael F. Stauff, SVP  
& Treasurer

-----  
William R. Howell, AVP

SILICON VALLEY BANK

By: -----

Title: -----

-7-

## NEGATIVE PLEDGE AGREEMENT

This Negative Pledge Agreement is made as of July 16, 1998, by and between SILICON VALLEY BANK, a California-chartered bank with its principal place of business at 3003 Tasman Drive, Santa Clara, CA 95054 and with a loan production office located at Wellesley Office Park, 40 William Street, Suite 350, Wellesley, MA 02181, doing business under the name Silicon Valley East ("Bank"), and TRANSWITCH CORPORATION, a Delaware corporation with its principal place of business at 3 Enterprise Drive, Shelton, Connecticut 06484 ("Borrower").

In connection with the Loan Documents (as that term is defined in the Commitment Letter between Borrower and Bank dated July 1, 1993, as amended) concurrently being executed between Borrower and Bank, Borrower agrees as follows:

1. Borrower shall not, without Bank's prior written consent which consent shall not be unreasonably withheld, sell, transfer, or assign other than in the ordinary course of business mortgage, pledge, lease, grant a security interest in, or encumber any of Borrower's property, including, without limitation, the following:

- (a) All goods and equipment now owned or hereafter acquired, including, without limitation, all machinery, fixtures, vehicles (including motor vehicles and trailers), and any interest in any of the foregoing, and all attachments, accessories, accessions, replacements, substitutions, additions, and improvements to any of the foregoing, wherever located;
- (b) All inventory, now owned or hereafter acquired, including, without limitation, all merchandise, raw materials, parts, supplies, packing and shipping materials, work in process and finished products including such inventory as is temporarily out of Borrower's custody or possession or in transit and including any returns upon any accounts or other proceeds, including insurance proceeds, resulting from the sale or disposition of any of the foregoing and any documents of title representing any of the above;
- (c) All contract rights and general intangibles now owned or hereafter acquired, including, without limitation, goodwill, trademarks, service marks, trade styles, trade names, patents, patent applications, leases, license agreements, franchise agreements, blueprints, drawings, purchase orders, customer lists, route lists, infringements, claims, computer programs, computer discs, computer tapes, literature, reports, catalogs, design rights, income tax refunds, payments of insurance and rights to payment of any kind;
- (d) All now existing and hereafter arising accounts, contract rights, royalties, license rights and all other forms of obligations owing to



Borrower arising out of the sale or lease of goods, the licensing of technology or the rendering of services by Borrower, whether or not earned by performance, and any and all credit insurance, guaranties, and other security therefor, as well as all merchandise returned to or reclaimed by Borrower;

-2-

- (e) All documents, cash, deposit accounts, securities, investment property, letters of credit, certificates of deposit, instruments and chattel paper now owned or hereafter acquired and Borrower's Books relating to the foregoing;
- (f) All copyright rights, copyright applications, copyright registrations and like protections in each work of authorship and derivative work thereof, whether published or unpublished, now owned or hereafter acquired; all trade secret rights, including all rights to unpatented inventions, know-how, operating manuals, license rights and agreements and confidential information, now owned or hereafter acquired; all mask work or similar rights available for the protection of semiconductor chips, now owned or hereafter acquired all claims for damages by way of any past, present and future infringement of any of the foregoing; and
- (g) All Borrower's Books relating to the foregoing and any and all claims, rights and interests in any of the above and all substitutions for, additions and accessions to and proceeds thereof.

2. It shall be an event of default under the Loan Documents between Borrower and Bank if there is a breach of any terms of this Negative Pledge Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as a sealed instrument as of the date first set forth above.

"Borrower"

"Bank"

TRANSWITCH CORPORATION

SILICON VALLEY BANK, doing business  
as SILICON VALLEY EAST

By: /s/ Michael F. Stauff

By:

-----  
Michael F. Stauff, SVP & Treasurer

-----  
William R. Howell, AVP

## SUBSIDIARIES OF THE COMPANY

<TABLE>  
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Name	Jurisdiction
----	-----
<S>	<C>
TranSwitch Europe N.V./S.A.	Belgium
TranSwitch India Private Limited	India

</TABLE>

## Report and Consent of Independent Auditors

To the Board of Directors and Shareholders of TranSwitch Corporation:

The audits referred to in our report dated January 21, 1999, except for Note 12, which is as of February 12, 1999, included the related financial statement schedule for each of the years in the three-year period ended December 31, 1998, included in the TranSwitch Corporation 1998 Annual Report on Form 10-K. This financial statement schedule is the responsibility of the Company's management. Our responsibility is to express an opinion on this financial statement schedule based on our audits. In our opinion, such financial statement schedule, when considered in relation to the basic consolidated financial statements taken as a whole, presents fairly, in all material respects, the information set forth therein.

We consent to the use of our reports included herein and incorporated by reference in the Registration Statements of TranSwitch Corporation on Form S-8 (No. 33-94234) and Form S-3 (No. 333-40897), relating to the consolidated balance sheets of TranSwitch Corporation and subsidiaries as of December 31, 1998 and 1997, and the related consolidated statements of operations, stockholders' equity, and cash flows and related financial statement schedule for each of the years in the three-year period ended December 31, 1998, which reports appear in the TranSwitch Corporation 1998 Annual Report on Form 10-K.

KPMG LLP

Stamford, Connecticut  
March 26, 1999

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